Taxonomy and diversity of the sponge fauna from Walters Shoal, a shallow seamount in the Western Indian Ocean region

By

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A thesis submitted in partial fulfilment of the requirements for the degree of Magister Scientiae in the Department of Biodiversity and Conservation Biology, University of the Western Cape.

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Abstract

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Seamounts are poorly understood ubiquitous undersea features, with less than 4% sampled for scientific purposes globally. Consequently, the fauna associated with seamounts in the Indian Ocean remains largely unknown, with less than 300 species recorded. One such feature within this region is Walters Shoal, a shallow seamount located on the South Madagascar Ridge, which is situated approximately 400 nautical miles south of Madagascar and 600 nautical miles east of South Africa. Even though it penetrates the euphotic zone (summit is 15 m below the sea surface) and is protected by the Southern Indian Ocean Deep-Sea Fishers Association, there is a paucity of biodiversity and oceanographic data. Thus, a multidisciplinary cruise was initiated in May 2014 on the FRS *Algoa* as a component of the African Coelacanth Ecosystem Programme. The research presented here focuses exclusively on the diversity, bathymetric distribution patterns and biogeographic affiliations of the sponge fauna of this seamount.

Sponges were sampled using SCUBA and a roughed epibenthic sled, from the peak and down two opposing slopes of the seamount, to a depth of 500 m. Two hundred and fifty-five sponge specimens were collected, comprising 78 operational taxonomic units (OTU's), 23 of which are known to science, 26 which are possibly new, 16 that could only be identified to higher taxonomic levels and 13 that could only be designated as morphospecies. Thirteen OTU's are formally described here, four which are known, and nine possibly new to science.

Sponge assemblages demonstrated no significant difference according to location on the shoal, with several species shared by both the western and eastern flanks. In contrast, sponge assemblages differed significantly according to depth, with the mesophotic zone (31 – 150 m) acting as a transition between the shallow (15 – 30 m) and submesophotic (> 150 m) zones. Species richness and the number of putative new species was highest in the submesophotic zone. Biogeographical affiliations were found with both the Western Indo-Pacific and Temperate Southern African realms based on the 23 known species recorded. No affiliations were found with the West Wind Drift Island Province, as has been documented previously for the fish fauna of this seamount, possibly due to the incomplete nature of the online database (World Porifera Database) used to assess affinities. Thirty-nine percent of the known sponge species found at Walters Shoal Seamount are widely distributed in the Indian Ocean, 35% are found exclusively within the Western Indian Ocean region, with this study representing the southernmost distribution record for several of these, and 26% have a restricted distribution around South Africa.

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Declaration

I declare that *Taxonomy and diversity of the sponge fauna from Walters Shoal, a shallow seamount in the Western Indian Ocean region* is my own work, that is has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Robyn Pauline Payne December 2015

Signed:

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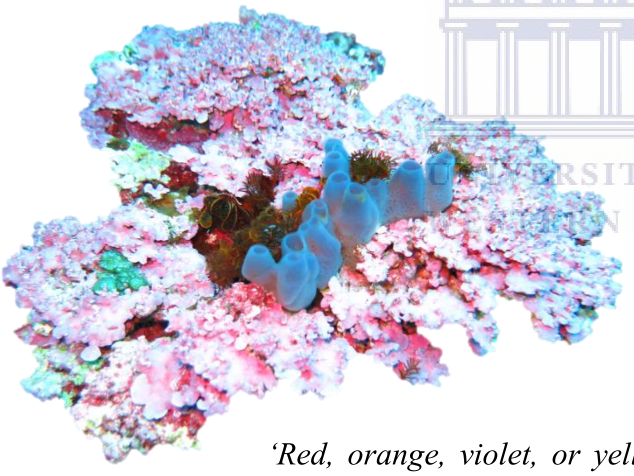
‘*On the undersea mountains live myriads of animals, particularly attached forms, which of all deep-sea organisms are least accessible to the biologist.*’

– Marshall (1979)



‘Red, orange, violet, or yellow, they [sponges] *stand out against the whiteness of the sand or are projected on the greenish background of rocks and look like fantastically beautiful shrubbery planted by an unknown hand in a submarine garden.’*

– Galtsoff (1960)

The deep sea is the largest ecosystem on Earth, constituting approximately 90% of the ocean (Gage & Tyler 1991, Ramirez-Llodra *et al*. 2010). Yet, due to the remote nature of this environment and the expense of research, including the fickle nature of funding (Gage & Tyler 1991, Rex & Etter 2010), only 5% of the deep sea has been investigated via remote equipment, and less than 0.01% of the deep-sea floor has been sampled in any detail (Ramirez-Llodra *et al*. 2010). Thus, this region is the least explored and understood ecosystem on Earth (Ramirez-Llodra *et al*. 2010). The lack of scientific knowledge about the deep sea not only permits creative speculation from researchers in this field (Batson 2003), but also enabled paradigms to be perpetuated far longer than justified (Gage & Tyler 1991). This is illustrated in the previously prolonged opinion that the unlit, cold and energy-deprived nature of the deep sea shaped an environment that was not conducive for life (Rex 1981, Rex & Etter 2010, Ramirez-Llodra *et al*. 2011).

To date, from samples collected, aided increasingly by new technology and a relatively recent international research effort, it has been revealed that the deep sea supports one of the highest levels of biodiversity on earth (Smith *et al*. 2008, Blaustein 2010, Costello *et al*. 2010, Ramirez-Llodra *et al*. 2010, Rex & Etter 2010). This ecosystem is also comprised of a variety of distinct habitats, with twenty eight new habitats having been discovered in the deep sea since the 1840s (Ramirez-Llodra *et al*. 2010). Subsequently, this ecosystem is now viewed as comprising vast expanses of continental slope and abyssal plains, interspersed with other geological features that host unique faunal communities (Ramirez-Llodra *et al*. 2010). The seamount habitat is one such feature.

1.1 A deep-sea habitat: the seamount

Seamounts are submerged inactive volcanoes, otherwise known as undersea mountains, which are predominantly found on the oceanic crust (Gage & Tyler 1991, Batson 2003, Wessel 2007, Ramirez-Llodra *et al*. 2010). The definition of this geological feature is subject to a significant amount of inconsistency and ambiguity (Pitcher *et al*. 2007, Staudigel *et al*. 2010), largely due to differences in the way that scientists from different disciplines define them (Staudigel *et al*. 2010). These features were originally defined as isolated peaks with an elevation greater than 1000 m above the seafloor (Menard 1964, Rogers 1994, Pitcher *et al*. 2007) due to difficulties in distinguishing smaller seamounts from the seafloor topography (Schmidt & Schmincke 2000, Staudigel *et al*. 2010). However, with no geological or ecological reason to separate smaller volcanic features from larger ones (Schmidt & Schmincke 2000, Wessel 2007, Consalvey *et al*. 2010, Clark *et al*. 2011, Yesson *et al*. 2011), this 1000 m constraint has been relaxed (Pitcher *et al*. 2007). Currently, the definition includes most features which rise more than 100 m from the seafloor (Smith & Cann 1992, Schmidt & Schmincke 2000, Staudigel *et al*. 2010, Kvile *et al*. 2014), with this cut-off chosen as features of this size can largely be recognised as individual volcanoes (Staudigel *et al*. 2010).

Seamounts may occur in isolation, clusters or chains (Schmidt & Schmincke 2000, Batson 2003, Mladenov 2013), but overall they constitute approximately 2.6 – 4.7% of the seafloor (Ramirez-Llodra *et al*. 2010,Yesson *et al*. 2011). These features are ubiquitous and are distributed unevenly among the ocean basins (Kitchingman & Lai 2004, Wessel 2007, Consalvey *et al*. 2010, Wessel *et al*. 2010), with most found in the Pacific (Wessel 2007). That said, the global distribution and abundance of seamounts is difficult to estimate (Schmidt & Schmincke 2000, Kitchingman & Lai 2004, Consalvey *et al*. 2010, Yesson *et al*.

2011) as these factors are dependent on the resolution of bathymetric maps used, as well as how these features are defined in a given study (Kitchingman & Lai 2004).

Yesson *et al*. (2011) notes several studies that have attempted to determine global seamount abundance. Although estimates vary, most suggest that, based on extrapolation, more than 100 000 large seamounts exist (Wessel 2001, Wessel 2007, Wessel *et al*. 2010), with this number rising into the millions when the smallest seamounts are included (Hillier & Watts 2007, Wessel 2007). More recently, Yesson *et al*. (2011) used high resolution satellite bathymetry data to compile the largest global set of seamounts and knolls. These authors identified 33 452 seamounts (using the 1000 m cut-off) worldwide.

Regardless of the widespread nature of this habitat, less than 300 (0.4 – 4%) seamounts have been directly sampled for scientific purposes globally (Kvile *et al*. 2014). This lack of sampling could possibly be attributed to logistical difficulties associated with their steep, rocky topography (Rex & Etter 2010, Williams *et al*. 2015). In spite of this, an increasing amount of work is being done on seamounts, with some progress being made with regards to documenting and understanding the biodiversity and connectivity of the biological communities that inhabit them (Clark *et al*. 2010).

The biodiversity of seamount communities

Seamounts have unique hydrographic conditions, brought about by their raised topography and complex rocky substratum that differs considerably from the soft sediments of the surrounding deep-sea floor (Glover & Smith 2003, Ramirez-Llodra *et al*. 2010). Consequently, these features are regions of increased productivity, which support abundant benthic and pelagic communities (Batson 2003, Glover & Smith 2003, Ramirez-Llodra *et al*. 2011).

Sessile epifaunal suspension feeders generally colonise the slopes of these underwater features (Marshall 1979, Wilson & Kaufman 1987, Samadi *et al*. 2007, Consalvey *et al*. 2010, Ramirez-Llodra *et al*. 2010), taking advantage of current amplifications that increase food supply (Genin 2004, Ramirez-Llodra *et al*. 2010), remove sediment (Genin 2004) and play a role in larval transport (Consalvey *et al*. 2010). This group of organisms is dominated by cnidarians (Samadi *et al*. 2007, Consalvey *et al*. 2010), although sponges, crinoids, molluscs, ascidians and cirripeds are also prominent (Rogers 1994, Samadi *et al*. 2007, Consalvey *et al*. 2010). These benthic assemblages act as biogenic environments that host numerous mobile species and which form an element of the surprisingly complex seamount food web (Samadi *et al*. 2007).

The ichthyofauna represent another component of the seamount ecosystem, and a total of almost 800 associated fish species have been recorded by Morato *et al*. (2004). Seamounts generally support an elevated plankton and fish biomass when compared to surrounding waters, especially in oligotrophic oceans (Clark *et al*. 2010). This is attributed to the enhanced productivity over these features, which is a difficult phenomenon to understand due to sparse data availability (Batson 2003, Ramirez-Llodra *et al*. 2010).

It was first thought that hydrographic events, such as upwelling and eddies, around seamounts enhanced local surface primary productivity, fuelling higher trophic levels (Consalvey *et al*. 2010). To date, there is little evidence to support this theory, with upwelling rarely penetrating the photic layer nor persisting long enough to enable zooplankton growth (Genin & Dower 2007, White *et al*. 2007). Current theories suggest that the food supply is imported from elsewhere (Consalvey *et al*. 2010), including topographically trapped vertically migrating zooplankton and/or horizontally advected micronekton (Genin 2004, Genin & Dower 2007, Kvile *et al*. 2014).

Nonetheless, the enhanced productivity of seamounts attracts numerous top-level predators (Worm *et al*. 2003). These include tuna, billfish, sharks, cetaceans, pinnipeds, turtles and seabirds (Batson 2003, Holland & Grubbs 2007, Kaschner 2007, Litvinov 2007, Santos *et al*. 2007, Thompson 2007). This attraction could also be attributed to the role these features might play in navigation (Holland & Grubbs 2007, Kaschner 2007), or as a breeding ground (Litvinov 2007).

With such diverse assemblages of benthic organisms, ichthyofauna and other visiting mobile species, seamounts are often referred to as biodiversity hotspots (McClain 2007, Samadi *et al*. 2007). As a result, there is substantial research interest in this habitat, often motivated by the notion that seamounts host unique communities that are dissimilar to those that inhabit the surrounding deep sea (Stocks & Hart 2007).

The distinctness and connectivity of seamount communities

A key question in seamount research is the extent to which seamounts represent isolated habitats with unique communities (Stocks & Hart 2007). Initially, it was thought that seamounts act as stepping stones across the ocean basins, facilitating species dispersal (Hubbs 1959, Stocks & Hart 2007, Shank 2010). Conversely, numerous records of endemic seamount species (Wilson & Kaufmann 1987, de Forges *et al*. 2000), suggest that these features act more like biological islands as a result of geographic isolation and unique physical conditions (Clark *et al*. 2010). To date, evidence supporting the ability of these factors to create a distinct community is mixed (Stocks & Hart 2007, Consalvey *et al*. 2010, Shank 2010).

Plankton and pelagic fish species that inhabit seamounts seem to be similar to, or the same as, those from nearby oceanic pelagic communities, and endemics are not reported often (Stocks & Hart 2007, Shank 2010). On the other hand, the benthic fish and invertebrates seem to differ slightly more from the surrounding seafloor or continental margins and have higher rates of endemism (Stocks & Hart 2007). This could be attributed to the distinctness of the seamount habitat, and thus environmental factors, when compared to the surrounding area (Stocks & Hart 2007). The benthic community is also determined by depth, according to environmental gradients (such as temperature and oxygen concentration) that are associated with this factor (Stocks & Hart 2007, Clark *et al*. 2010, Consalvey *et al*. 2010).

Seamounts generally span a spectrum of endemicity (Stocks & Hart 2007), and too little work has been done on these features to enable or support any generalizations on this topic (Shank 2010). This is also the case for many other theories that have been ascribed to seamounts (Kvile *et al*. 2014). Describing these deep-sea habitats as biodiversity hotspots, biogeographical islands and oases which host lush sponge or coral gardens are tenets, many of which have become prevalent in the literature and the minds of those working on these features (Rowden *et al*. 2010). Yet, their accuracy has been called into question (McClain 2007, Rowden *et al*. 2010), with Samadi *et al*. (2007) suggesting that many seamount 'traits', such as archaism and endemism, may be artefacts of the increased sampling and work done on seamounts when compared to other deep-sea environments. This increased knowledge of seamounts is a by-product of fisheries studies (Brewin *et al*. 2007, Samadi *et al*. 2007, Consalvey *et al*. 2010), with commercial fishing having the largest negative anthropogenic impact on this habitat (Clark *et al*. 2010).

Anthropogenic threats to seamounts

In the late 1960s and 1970s, the former Soviet Union began an intensive global search for seamount fishery resources (Clark *et al*. 2007). These searches were conducted systematically by offshore trawler fleets in the Pacific, Atlantic and Indian Oceans (Clark *et al*. 2007), which may have been partially motivated by the declarations of the 200 nautical mile exclusive economic zones (EEZs) around most nations' productive coastal waters (Watson *et al*. 2007). After finding large aggregations of fish and invertebrates, commercial fisheries developed in a number of regions, with many countries pursuing fisheries on seamounts (Clark *et al*. 2007, Morato & Clark 2007, Consalvey *et al*. 2010). These were aided by significant technological advancements in the 1980s and 1990s, especially with regards to navigation (Brewin *et al*. 2007, Clark & Koslow 2007, Clark *et al*. 2010), which was important when fishing the rugged terrain of the seamount habitat (Batson 2003).

Many of these fisheries have not been sustainable, with a number of them exhibiting a boom-and-bust pattern (Clark *et al*. 2007). Fulton *et al*. (2007) notes that fish populations of certain seamounts are often exhausted within five to ten years of exploitation, and probably take decades to recover. The vulnerability of these fish populations is often due to their life history and ecological characteristics (Morato & Clark 2007). The species concerned are often long-lived, have a late age at maturity, low fecundity and sporadic reproduction (Clark 2001, Brewin *et al*. 2007, Morato *et al*. 2008). They are also concentrated in a relatively small area and need large spawning aggregations for successful recruitment (Brewin *et al*. 2007), enabling big catches and a quick depletion of stock size (Clark & Koslow 2007, Clark *et al*. 2010). Other negative effects include a reduction in genetic diversity, the removal of apex predators via bycatch (Batson 2003) and the discharge of processing waste (Clark & Koslow 2007).

The benthic seamount habitat and its associated fauna are also very vulnerable to the effects of fishing (Clark & Koslow 2007, Consalvey *et al*. 2010, Clark *et al*. 2015), especially with regards to bottom trawling (Clark & Koslow 2007, Clark *et al*. 2007). Demersal fauna is often dominated by large, slow-growing sessile animals (Batson 2003, Clark & Koslow 2007), which have a limited spatial extent, low larval output, possibly limited recruitment between seamounts, and a very localised distribution (Samadi *et al*. 2007, Consalvey *et al*. 2010). When removed as bycatch (Batson 2003), the seamount may take decades to recover (Consalvey *et al*. 2010, Clark *et al*. 2015). The benthic species composition, abundance, age composition, size structure and overall structural complexity may also be impacted (Clark & Koslow 2007). Indirect effects include sediment re-suspension and mixing (Batson 2003, Clark & Koslow 2007). Finally, endemic species may be at an increased risk of extinction (Samadi *et al*. 2007).

Other possible threats to the seamount habitat include the mining of cobalt-rich ferromanganese crusts (Ramirez-Llodra *et al*. 2010), invasive organisms, pollution, rising carbon dioxide levels (Guinotte *et al*. 2006) and climate change (Batson 2003).

Historically, seamounts have not been well protected (Fulton *et al*. 2007, Consalvey *et al*. 2010). Unregulated, extensive commercial fishing often occurs on the high seas (both in the past and presently), with these areas falling outside of any nations jurisdiction (Consalvey *et al*. 2010). When regulations are in place, enforcement on the high seas is also a challenge (Consalvey *et al*. 2010). In addition, there has also been little obligation to collect information that is important with regards to effective management (Fulton *et al*. 2007). Other issues include incorrect reports on fishing activities (Clark *et al*. 2007), the inability to relate catch statistics to a specific seamount (Watson *et al*. 2007) and a lack of scientific and fisheries data (Clark *et al*. 2007), all of which are important for fisheries models (Brewin *et al*. 2007).

A major factor which hinders the successful management of this deep-sea habitat is the sparse nature of data at both national and international levels (Davies *et al*. 2007, Clark *et al*. 2011). For example, the impact of fishery-based disruption on seamount communities is difficult to measure, with little known of their recovery process (Clark & Koslow 2007, Consalvey *et al*. 2010, Clark *et al*. 2015). This places pressure on scientists to obtain information in order to suggest appropriate management plans (Clark *et al*. 2010).

Future research

Since the time that the exploitation of seamounts began, the field of seamount biology has grown, especially in recent decades (Brewin *et al*. 2007). Despite this, we still know little about these deep-sea habitats and the communities they contain. The fauna of these habitats are poorly documented (Samadi *et al*. 2007, Consalvey *et al*. 2010) and the structure of whole assemblages is only known from relatively few seamounts worldwide (Samadi *et al*. 2007). The lack of taxonomic expertise, slow description rates of new species and varied sampling methods also limit what can be done with the sparse data that are available (Samadi *et al*. 2007, Ramirez-Llodra *et al*. 2010). Further bias has also arisen due the greater sampling of larger fauna (Clark *et al*. 2010). Moreover, certain seamount types and locations are understudied, such as deep seamounts, and those in the equatorial regions or at high latitudes (Clark *et al*. 2010).

Seamounts may be one of the last major frontiers of exploration on Earth, especially from a geographic, ecological and geological point of view (Wessel *et al*. 2010). The purpose of seamount conservation and management has ignited a new era of multidisciplinary research and international collaboration (Brewin *et al*. 2007, Kvile *et al*. 2014). Examples of this include the Global Census of Marine Life on Seamounts (CenSeam) (Stocks *et al*. 2012) and the Seamount Ecosystem Evaluation Framework (SEEF) (Kvile *et al*. 2014), which have elevated the seamount habitat in the public eye (Consalvey *et al*. 2010). The current knowledge of seamounts would be enhanced by the standardisation of sample collection and data sharing (Consalvey *et al*. 2010), as would future research in understudied regions, such as the Indian Ocean (Clark *et al*. 2010, Consalvey *et al*. 2010).

1.2 Seamounts of the Indian Ocean

An intermediate number of seamounts occur in the Indian Ocean (Ingole & Koslow 2005), with these deep-sea habitats being the most poorly explored of this region (Wafar *et al*. 2011). Overall, Sautya *et al*. (2011) suggests that 15 seamounts have been investigated biologically in this Ocean, but only four of these (Equator Seamount, Fred Seamount, Mount Error Guyot and Walters Shoal Seamount) have well documented benthos, and only single records are known from the others. Thus, the fauna of seamounts remain effectively unknown in the Indian Ocean (Rogers *et al*. 2009, Sautya *et al*. 2011, Kvile *et al*. 2014), with the number of species recorded from these features currently less than 300 (Wafar *et al*. 2011). This limited understanding of biodiversity, both generally in this ocean, and of the seamounts it contains, can be attributed to the lack of funding and capabilities (human, technical and institutional) in its surrounding countries (Wafar *et al*. 2011).

Marine research in the Indian Ocean is intertwined with its colonial past, with most work to date having been done by European scientists (Wafar *et al*. 2011). Extensive sampling was carried out during the International Indian Ocean Expedition (Rogers *et al*. 2009), but the main source of information regarding seamount biology has been scientific and/or fisheries reports of past Soviet and French expeditions, which focused predominantly on ichthyofauna and plankton according to their interest in seamount fisheries (Romanov 2003, Ingole &

Koslow 2005, Rogers *et al*. 2009, Letessier *et al*. 2015). In addition, work on the seamounts of this region often remains in an unpublished state, in grey literature and/or is often unavailable in English, making it difficult to find and access (Kvile *et al*. 2014).

Walters Shoal: a shallow seamount in the Western Indian Ocean region

Compared to other seamounts in the Indian Ocean, quite a few studies have been carried out on Walters Shoal. This shallow seamount is located on the South Madagascar Ridge at 33°13'S, 43°51'E and lies approximately 400 nautical miles south of Madagascar and 600 nautical miles east of South Africa (Fig. 1). During the Pleistocene (and possibly the Tertiary) period, Walters Shoal was exposed to subaerial erosion (Schlich *et al*. 1974). Today, this seamount forms part of a benthic protected area voluntarily closed to trawl fishing by the Southern Indian Ocean Deep-sea Fishers Association (SIODFA) (Shotton 2006, Rogers *et al*. 2009, Letessier *et al*. 2015).

Rogers *et al*. (2009) attributes the past and present interest in this seamount to its close proximity to land and to the commercial fishery focus in this region. Its accessibility could also play a role, with the shallow seamount lying approximately 15 m below the sea surface (Rogers 2012, Pollard & Read 2015, Fig. 2). Accordingly, this atypically domed structure penetrates the euphotic zone, enabling its shallowest depths to be covered in rhodolith-forming coralline encrusting algae (Kensley 1969, Collette & Parin 1991) and coral (Romanov 2003).

Walters Shoal was sampled in 1964 during the International Ocean Expedition by the RV *Anton Bruun*, giving rise to the discovery of several invertebrates. Clark (1972) described a new endemic subspecies of crinoid, *Comanthus wahlbergi tenuibrachia* (currently

Comanthus wahlbergi), while Kensley (1975) noted a new endemic isopod, *Jaeropsis waltervadi*. An endemic species of alpheid shrimp, *Alpheus waltervadi*, was also discovered on the shoal, and the presence of four other decapods was recorded (Kensley 1969, Kensley 1981). The coral *Enallopsammia amphelioides* was collected (in addition to a few fish) in 1976 using the French vessel, *Marion Dufresne* (Zibrowius 1982), while the search for fishery resources by both French and Soviet vessels led to the finding of many fish (and some crustacean) species (Collette & Parin 1991, Romanov 2003, Rogers *et al*. 2009). The 17th cruise of the Soviet oceanographic vessel, *Vityaz* in 1988 – 1989 provided more details on the ichthyofauna inhabiting Walters Shoal. Collette & Parin (1991) recorded 20 fish species obtained down to approximately 400 m, while 52 cephalopod species were collected on, over and around the seamount (Nesis 1994). A few new endemic fish species were also discovered (Poss & Collette 1990, Collette *et al*. 1991, Iwamoto *et al*. 2004), while work regarding the brachiopods of Walters Shoal has also arisen based on a few collections during this cruise (Zezina 2010). In addition, macroplankton collected was included in the work by Vereshchaka (1995), which was a comprehensive summary of several investigations regarding macroplankton found in the near-bottom layer of seamounts and slopes in the Indian Ocean. Studies on the distribution patterns of Walters Shoal benthic and water-column fauna were carried out by the P.P. Shirshov Institute of Oceanology in the 1980s (T. N. Molodtsova, personal communication, September 2, 2015). However, these works including Parin *et al*. (1993) and Detinova & Sagaidachny (1994) are largely inaccessible. These data may be available on OBIS (Ocean Biogeographic Information System, available: www.iobis.org/mapper/) according to T.N. Molodtsova (personal communication, September 2, 2015), which may account for the 288 taxa recorded from Walters Shoal Seamount by Sautya *et al*. (2011).

More recently, a commercial fishing trip aboard the Spanish fishing vessel *Iannis*, led to the discovery of a new species of spiny lobster, *Palinurus barbarae* (Groeneveld *et al*. 2006). In 2009, the RV *Dr Fridtjof Nansen* undertook a cruise aimed at understanding the pelagic biology and physical oceanographic setting of the seamounts on the Southwest Indian Ocean Ridge, including a sampling location on or near Walters Shoal Seamount (see Rogers *et al*. 2009). Studies from the data and samples collected have led to recent publications on physical oceanography (Read & Pollard 2015), circulation (Pollard & Read 2015), the distribution of micronektonic crustaceans (Letessier *et al*. 2015) and cephalopod diversity (Laptikhovsky *et al*. 2015). Rogers *et al*. (2009) also noted the presence of marine mammals, including sperm whales, humpback whales and short-finned whales. Blue whales and fin whales were also possibly observed. These accounts support sightings of humpback whales by Collette & Parin (1991) and Shotton (2006), suggesting that Walters Shoal may be an important migratory area between feeding and breeding grounds (Shotton 2006). In addition, tracking data have revealed that Walters Shoal is an important foraging ground for both the red-tailed tropicbird and Barau's petrel (Le Corre *et al*. 2012), probably due to upwelling and local enrichments.

The previous work done on the fish (Collette & Parin 1991, Iwamoto *et al*. 2004) and cephalopod (Nesis 1994) fauna led to the current understanding of the biogeographical affiliations of Walters Shoal Seamount. Collette & Parin (1991) found the shallow-water fish fauna to be composed of three elements, including endemics (to the West Wind Drift or Indian Ocean islands and seamounts within the region, or just to Walters Shoal; six to seven species), widespread temperate or subtropical species (six to seven) and tropical Indo-West Pacific reef species (six). No Antarctic and Subantarctic species were found and there was little similarity to the fishes of South Africa (Collette & Parin 1991). These authors suggest that the fish fauna of Walters Shoal link the Tristan-Gough Province (Southern South

America Cold Temperate Region) with the Amsterdam-St. Paul Province (Southern African Warm Temperate Region) as defined by Briggs (1974) into a single biogeographic province, which they named the West Wind Drift Islands Province (WWDIP). This province includes Tristan da Cunha, Gough Island, Vema Seamount, Walters Shoal, UN-2 (unnamed seamount south of Madagascar) and the St Paul and Amsterdam islands (Nesis 2003). Most of this chain lies along the edge of the West Wind Drift (WWD), which is an eastward-flowing Subantarctic surface current, with a northern boundary defined by the Subtropical Convergence Zone (Iwamoto *et al*. 2004). Similar findings were documented with the cephalopod fauna (Nesis 2003), with Iwamoto *et al*. (2004) suggesting that the fish fauna found at Walters Shoal can be explained by its location within the northern oscillatory region of the WWD, thus comprising both subtropical and Subantarctic elements, as seen with the grenadier fauna.

The work by Parin *et al*. (1993) (as cited by Iwamoto *et al*. 2004) included both shallow-water fish and invertebrates. These authors suggest that the source faunas for Walters Shoal were the tropical Western Indian Ocean, southernmost South Africa and islands of the WWD. On the other hand, they found that subtropical, antitropical and southern peripheral species dominated on the continental slope and midwaters.

Although Walters Shoal has been relatively well sampled, there is still a paucity of available biodiversity and oceanographic data. Thus, a multidisciplinary cruise was launched in May to June 2014 as a component of the third phase of the African Coelacanth Ecosystem Programme (ACEP III). Sponsored by the National Research Foundation (NRF) and supported by the Department of Environmental Affairs (DEA) Oceans and Coasts Branch, participants included members of the Department of Agriculture Forestry and Fisheries (DAFF), the South African Environmental Observation Network (SAEON), DEA and students from both Rhodes University (RU) and the University of the Western Cape (UWC).

As one of the few South African expeditions to explore this unique feature, the aim of the cruise was to gain detailed information on the benthic fauna (invertebrates and fish) associated with the photic and subphotic zone, while also collecting information on the physical and chemical environment. Combined, this data would provide a better understanding of the Walters Shoal ecosystem.

This thesis falls under the above-mentioned larger project, with the aim to investigate the diversity and distribution of the sponge fauna from Walters Shoal, while also assessing the possible connectivity between this shallow seamount and adjacent regions. The four main objectives of this study are as follows:

I) To sample and identify the sponges collected from Walters Shoal Seamount.

II) To describe a subset of the sponges collected from this seamount in order to illustrate some of the potentially new species found in this study.

III) To determine whether sponge assemblages differ according to location (western vs. eastern flank) and depth (shallow, mesophotic, submesophotic) on the seamount.

IV) To further investigate the biogeographical affiliations of Walters Shoal Seamount, especially within the larger Western Indian Ocean and West Wind Drift context.

1.3 Why sponges?

Sponges (phylum Porifera), are considered to be amongst the first and simplest metazoans (Batson 2003, Pechenik 2009) and although they lack the complexity observed in other animal taxa, they comprise a highly successful and variable group (Marshall 1979, Gage & Tyler 1991). Found in a range of environmental conditions, 98% of sponge species are marine (Pechenik 2009) and inhabit all depths (Galstoff 1960, Bell & Carballo 2008, van Soest *et al*. 2012).

In addition to their ubiquitous nature, sponges act as prominent, ecologically significant and competitive components of marine benthic communities (Branch & Branch 1981, Barnes & Bell 2002, Samaai 2006, van Soest 2007, Pechenik 2009). These organisms may serve as a food source for demersal grazers and other predators (Kelly-Borges 1997, van Soest 2007), as well as acting as a biological habitat and/or hosts for associated (sometimes symbiotic) species (Jones & Gates 2010) including fish, macrofauna and microbes (Galstoff 1960, Batson 2003, Schuchert & Reiswig 2006, van Soest 2007, Pechenik 2009, van Soest *et al*. 2012). Some symbiotic microbes may play a part in the nitrogen cycle and possibly contribute organic production in nutrient impoverished environments (van Soest *et al*. 2012), while their hosts (as active suspension feeders) enable benthic-pelagic coupling (van Soest 2007, van Soest *et al*. 2012). Furthermore, sponges may act as bio-eroders (Kelly-Borges 1997, Holmes 2000, van Soest 2007, van Soest *et al*. 2012) and environmental quality indicators (Diaz & Rützler 2009).

From an anthropogenic point of view, sponges played an important role in ancient society, and continue to do so today. In the past, sponges were used as household items, for personal hygiene, for the relief of pain, for treating disease and in art (van Soest 2007, Voultsiadou 2007, van Soest *et al*. 2012). More recently, interest in sponges has largely arisen due to their, and/or their symbionts, production of novel chemical compounds, which may have potential biomedical and anti-fouling applications (Batson 2003, van Soest 2007, Pechenik 2009). In addition, the silica structures made by sponges (spicules) have instigated further interest due to their unique optical and mechanical properties, which may enable the manufacture of advanced materials (Sundar *et al*. 2003, Weaver *et al*. 2003). Finally, further study into sponges may lead to a greater understanding of life on Earth in an evolutionary context (van Soest *et al*. 2012).

Global sponge diversity

According to van Soest *et al*. (2012), approximately 8 500 valid sponge species are known, with most of these (around 80%) belonging to the class Demospongiae. However, our knowledge of sponge diversity is incomplete and at least double this number of species is thought likely to exist (van Soest 2007, van Soest *et al*. 2012). Although global patterns in sponge species diversity remain rudimentary (van Soest 1994, Wörheide *et al*. 2005), recent work by van Soest *et al*. (2012) suggests that these diversity patterns are similar to those recognised in other marine animal groups, i.e. more species in tropical regions, and fewer in colder areas of the global ocean. Yet, this pattern only emerges when looking at the most elevated spatial marine realms (as defined by Spalding *et al*. (2007)) or highest taxonomic ranks (Gage & Tyler 1991, van Soest 1994, Barnes & Bell 2002). At all spatial and taxonomic levels, sponge diversity data demonstrate a strong bias according to collection and taxonomy efforts (van Soest 1994, Barnes & Bell 2002, van Soest *et al*. 2012). The majority of sponges occur in regional or local areas of endemism, mainly because of the limited swimming capabilities of their larvae, asexual reproduction (van Soest *et al*. 2012), and environmental variables including light and turbidity (Wörheide *et al*. 2005). Thus, van Soest *et al*. (2012) suggest that a regional approach may currently provide more insight into the biogeographic history of sponges.

Regional expeditions and work on sponge biodiversity has increased over the past two decades (van Soest *et al*. 2012). As a result, many outputs including regional sponge guides, databases, inventories, websites and CD’s have been realised (van Soest 2007, van Soest *et* *al*. 2012). Other online databases focus on the natural compounds and symbionts of sponges, as well as barcoding and DNA-based identification (van Soest 2007, van Soest *et al*. 2012). The most internationally significant advancements include a comprehensive, multi-author, guide to the identification of sponges (the Systema Porifera), edited by Hooper & van Soest (2002), and the subsequent, regularly updated, searchable online database (the World Porifera Database, van Soest *et al.* 2015).

To date, much work still needs to be done, with more scientific focus placed on economically important species including molluscs, fish and crustaceans (Samaai, 2006, Costello *et al*. 2010). This also may be partly due to difficulties in sponge identification, associated with morphological plasticity, and a shortage in the relevant taxonomic capacity (Branch & Branch 1981, Kelly-Borges 1997, Barnes & Bell 2002, Batson 2003, Samaai 2006, Costello *et al*. 2010, Jones & Gates 2010). Other factors that hamper our knowledge of global sponge diversity include the often dated, scattered (and sometimes inaccessible) nature of the taxonomic literature, the lag between documenting, describing and distributing information on collected specimens, the numerous specimens awaiting description in museums worldwide, as well as the neglect of certain taxa (e.g. Calcarea) (Wörheide *et al*. 2005, van Soest *et al*. 2012). The lack of unsubstantiated and unpublished presence records, as well as collection effort, also plays a role, with many regions and habitats remaining largely undersampled (Wörheide *et al*. 2005, van Soest 2007, Costello *et al*. 2010, van Soest *et al*. 2012).

Seamount-inhabiting sponges

Globally, very little is known about seamount sponges (Vieira *et al*. 2010), with studies predominantly documenting sponge fauna diversity and/or describing new species (e.g.

Vieira *et al*. 2010, Cristobo *et al*. 2015, Kelly *et al*. 2015). Even less is known of seamount-inhabiting sponges in the Indian Ocean, with Sautya *et al*. (2011) suggesting that, prior to their study, there were only reports on 'Porifera' and 'Hexactinellida' from two Indian Ocean seamounts each in the literature.

Relatively comprehensive studies were carried out by Lévi (1969) on Vema Seamount (South-East Atlantic), who recorded 28 species (15 new, 53% endemic), Schlacher-Hoenlinger *et al*. (2005) who documented 16 (seven new) 'lithistid' sponges from South Pacific seamounts, with the fauna dominated by 'spot endemics' (species restricted to a single site) and the work done by Xavier & van Soest (2007). The latter authors assessed the diversity and biogeographical affiliations of the demosponge fauna of Gettysburg and Ormonde Seamounts on the Gorringe Bank (North-East Atlantic), finding 23 species, with 36 species recorded overall. This study also documented range extensions, a moderate faunal similarity (around 50% shared species) with adjacent locations and demosponge distribution patterns consistent with those observed for the mollusc and fish fauna of these seamounts. In contrast to these faunas, the sponge assemblage demonstrated a relatively high level of endemism (28%).

As documented in other sessile benthic assemblages on seamounts (e.g. Bo *et al*. 2011, Sautya *et al*. 2011, Thresher *et al*. 2014, McClain & Lundsten 2015), the sponge fauna inhabiting these features often demonstrates significant differences (e.g. diversity, abundance) with position on the seamount and depth, often according to local geomorphology and hydrodynamic conditions (Bo *et al*. 2011). Examples include studies by Henrich *et al*. (1992, Vesterisbanken Seamount), Pereira *et al*. (2015, Condor Seamount) and Xavier *et al*. (2015, Schultz Seamount).

The current state of knowledge of seamount-inhabiting sponges indicates a diverse fauna that is highly endemic, with existing estimates conservative, as many sponge collections have yet to be sorted and identified (Schlacher-Hoenlinger *et al*. 2005, Vieira *et al*. 2010).

To date, this thesis constitutes the only study dedicated exclusively to the diversity, distribution and biogeographical affiliations of the sponge fauna, not only of Walters Shoal Seamount, but also possibly from the seamount habitat in the Indian Ocean.

1.4 Hypotheses

Based on the previous research carried out on Walters Shoal Seamount, as well as ‘accepted’ or general principles (i.e. individual seamounts may show great variability) from other seamount studies worldwide, several hypotheses can be proposed regarding the sponge fauna of Walters Shoal:

I) **The sponge fauna will be diverse** as found in previous studies on seamount-inhabiting sponges (Lévi 1969, Schlacher-Hoenlinger *et al*. 2005, Xavier & van Soest 2007). These studies report assemblages with less than 40 species as diverse.

II) **Range extensions and sponge species new to science will be discovered** due to the undersampled and underworked state of the sponge fauna, not only of Walters Shoal, or of seamounts in the Indian Ocean (Sautya *et al*. 2011), but also of the Western Indian Ocean region in general (Kelly-Borges 1997, Richmond 2001).

III) **Sponge assemblages will not demonstrate a significant difference according to location (western vs. eastern flank) on the seamount**, due to its small size and the retentive nature of the waters above it (Nesis 1994, Gopal 2007).

IV) **Sponge assemblages will demonstrate a significant difference according to depth (shallow, mesophotic, submesophotic) on the seamount.** Seamount benthic communities are often determined by this factor, according to associated environmental gradients, including temperature and oxygen concentration (Stocks & Hart 2007, Clark *et al*. 2010, Consalvey *et al*. 2010). Previous works on seamount sessile benthic assemblages have noted such a difference (e.g. Bo *et al*. 2011, Sautya *et al*. 2011, Thresher *et al*. 2014, McClain & Lundsten 2015), including those on sponge fauna (Henrich *et al*. 1992, Pereira *et al*. 2015, Xavier *et al*. 2015).

V) **Sponge faunal affinities will be with surrounding regions including the tropical Western Indian Ocean, southernmost South Africa and the West Wind Drift Islands Province**, as was found for the fish fauna by Collette & Parin (1991), the cephalopod fauna by Nesis (2003), as well as both the fish and invertebrate fauna by Parin *et al*. (1993).

2.1 Collection

Sponges were collected from Walters Shoal Seamount during a single cruise aboard the RV *Algoa* from 15 May to 13 June 2014 (cruise number 208). Collections were carried out in a random-stratified regime, following Clark *et al*. (2004), using SCUBA and a roughed epibenthic sled, from the peak and down two opposing slopes (west and east) of the seamount (Table 1, Fig. 3, Fig. 4). Nine sled transects were undertaken, three in each depth strata (following Lesser *et al*. (2009)), including shallow water (15 – 30 m), the mesophotic zone (31 – 150 m) and the submesophotic zone (>150 m). Two SCUBA dives were carried out in shallow water (29 m), while eight sponge specimens found in a lobster trap (39 m) deployed on the trip, were also included.

Once collected, specimens were labelled and frozen, to retain colour following Hooper (2003), for processing onshore.

2.2 Taxonomic procedure

In the laboratory, the macroscopical features of each specimen were described (Fig. 5), with the aid of Boury-Esnault & Rützler (1997). Subsequently, a TS number (personalised number for collection of Toufiek Samaai) was assigned and digital colour photographs were taken of each specimen before being preserved in 96% ethanol.

Spicules

For the study of spicules by light and scanning electron microscopy (SEM), a small section (~3 mm^3) of tissue (including both ectosome and choanosomal regions) was placed in a test tube with a few drops of nitric acid. Once the tissue had digested, the spicules were rinsed in distilled water (centrifuged for 1 min at 3000 rpm) three times consecutively, twice with distilled water and once with 96% ethanol. Spicule samples were then stored at room temperature in 96% ethanol.

For light microscopy, spicule extracts were re-suspended and pipetted onto microscope slides, and air-dried at 40^0C. Subsequently, the mounting medium Entellan was added to the slides, followed by cover slips. These slides were then allowed to air dry at room temperature until the mountant had hardened. A Carl Zeiss AxioCam ERc 5s camera (mounted on a compound microscope) and ZEN 2012 software were used to measure ten spicules from each spicule category (per specimen). These dimensions are given as mean length (range) x mean width (range) followed by the number of spicule measurements taken (n). Spicule dimensions from other specimens obtained in this study, and from the literature where possible, are included to determine the level of intraspecific variability (Samaai & Gibbons 2005).

For SEM, spicule extracts were placed on film negative fixed to aluminium studs with superglue. Once the ethanol had evaporated, the studs were sputter-coated with gold-palladium and images taken using a FEI Nova NanoSEM 230 equipped with a field emission gun and digital imaging software programme. Such microscopy was necessary to perceive small but important spicule variations that confer specific identity (Hooper 1996).

Skeletal arrangement

A perpendicular section of tissue (~5 mm^3), including both ectosome and choanosomal regions, was collected from each specimen (where possible) and stored in 96% ethanol in order to document the skeletal structure and spicule arrangement. After the sample had been processed through a series of dehydrating and cleaning agents (Table 2), it was embedded in paraffin wax. Using a microtome, a section of ~30 – 90 µm was cut from the embedded sample and the wax removed via washing in Xylene (in a fume cupboard). After being mounted on a slide with Entellan, the skeletal arrangement was photographed using the equipment and software previously mentioned. Alternatively, where the above was not possible or did not reveal certain structures, a perpendicular section of tissue was coated with nitric acid and heated at 40^0C to remove tissue.

Digital images were combined on a black background, aligned and cleaned (when appropriate) using PowerPoint and Photoshop CS5.

Identification

Identifications to the lowest operational taxonomic unit (OTU) were possible through the consideration of the macroscopic features, spicule array and skeletal arrangement in conjunction with the consultation of the taxonomic literature. The work by Hooper & van Soest (2002) and the World Porifera Database (van Soest *et al*. 2015) was especially useful with regards to identifying specimens to genus level and documenting updated classifications respectively. The majority of specimens were identified to the genus level and compared to documented species within the region of interest (Table 3, Table A in appendix). When specimens were found to differ from these species, or represent the first record of a genus in the region of interest, they were denoted as sp. • and likely constitute species new to science, which will be subsequently described for publication. Several specimens could only be identified to higher taxonomic levels (i.e. order, family or tentative genus). These were denoted as sp. and require further investigation. Finally, specimens that lacked enough diagnostic material for identification, but were morphologically distinct, were designated as morphospecies (M).

2.3 Sample storage

Samples of all material will eventually be housed in the Natural History collection of the South African Iziko Museum in Cape Town, and accession numbers will be provided by this institution once deposited. Voucher samples will be kept in the private collection of Dr Toufiek Samaai presently of the Department of Environmental Affairs, Oceans and Coasts Branch.

2.4 Location and depth analyses

To determine whether the sponge fauna of Walters Shoal Seamount is associated with location (western vs. eastern flank) and depth (shallow, mesophotic, submesophotic; as defined above), Bray-Curtis coefficients based on a presence/absence (non-detection) matrix of the OTU's found at each sampling location (Table 4) were calculated using PRIMER v.6.1.11 (Plymouth Routines in Multivariate Ecological Research; Clarke & Gorley 2006). The two-way crossed analysis of similarity (ANOSIM) and non-metric multidimensional scaling (nMDS) ordination routines (see O'Hara (2007)) were performed to assess and visualise the sponge faunal similarities between sampling locations for both factors respectively. ANOSIM is an approximate equivalent of the standard ANOVA (analysis of variance), enabling a non-parametric test for statistically significant differences in the sponge assemblage composition between sample groups specified by the location and depth factor levels (Clarke & Gorley 2006), with the significance of this statistical test assigned here at the 5% level. SIMPER (similarity percentage analysis) is an exploratory analysis which indicates the species principally responsible for differences between sets of samples (Clarke & Gorley 2006) and was thus used to assess the extent of similarity both within and between the location and depth factors, while also identifying the species contributing to the observed (dis)similarity.

2.5 Biogeography analyses

To comment on the biogeographical affiliations of the Walters Shoal Seamount sponge fauna, it was compared to that of the surrounding regions pertinent to the hypotheses proposed (Table 3, Fig. 6, Table A in appendix). Species lists were extracted for these regions, from the World Porifera Database (van Soest *et al*. 2015), according to the MEOW (Marine Ecoregions of the World) biogeographical classification scheme as defined by Spalding *et al*. (2007). The similarity between these regions and Walters Shoal was assessed by calculating the ratio of shared species (known sponge species documented from this study) between each region and Walters Shoal Seamount and the total number of species recorded from Walters Shoal, following Xavier & van Soest (2007). Extracted lists were also used to determine the contribution of each family and genus to the sponge fauna of regions found to have biogeographical affiliations with Walters Shoal, for comparison with all OTU's recorded in this study.

3.1 Systematics

A total of 255 sponge specimens were collected from Walters Shoal Seamount, comprising 78 operational taxonomic units (OTU's) (Table 4, Table 5). There were representatives of six subgenera, 40 genera, three subfamilies, 28 families, one suborder, 14 orders, four subclasses and two classes. Twenty-three species (29.5%) are known and could be included in the biogeographical analyses. Twenty-six species (33.3%) were compared to species of the same genera within the region of interest (Table 3, Table A in appendix) and were found to differ, or represent the first record of a genus in the region of interest, and thus likely represent species new to science. Ten (12.8%), four (5.1%) and two (2.6%) species could only be identified to order, family and tentative genus level respectively and therefore require further investigation. Finally, 13 species (16.7%) could only be designated as morphospecies due to a lack of diagnostic material, but could still be included in location and depth analyses.

The dominant group was the class[1] Demospongiae, which comprised 63 species (80.8%) overall. Within this group, the subclass Heteroscleromorpha was well represented, comprising 59 species (75.6%), while the subclasses Keratosa and Verongimorpha comprised two species (2.6%) each. The class Calcarea was represented by two species (2.6%), both within the subclass Calcinea.

The orders Tetractinellida (13 species), Poecilosclerida (11 species) and Suberitida (11 species) were most speciose and together accounted for 44.9% of all species. The orders

[1] Higher taxa names follow the revised classification proposed by Morrow & Cárdenas (2015) and recognised by the World Porifera Database (van Soest *et al*. 2015).

Axinellida and Haplosclerida were also relatively well represented, with eight and seven species documented respectively. Three species obtained were from the order Bubarida, while the orders Agelasida, Biemnida, Clathrinida and Tethyida comprised two species each. Finally, one species was obtained for each of the orders Chondrosiida, Dendroceratida, Dictyoceratida and Verongiida.

The majority of species represent a single genus each. However, four species were designated to *Stelletta*, while three species each were designated to the genera *Phakellia* and *Protosuberites.* Two species each were designated to the genera *Amorphinopsis*, *Callyspongia*, *Eurypon* and *Tedania*.

3.2 Descriptions

For the purposes of this thesis, the taxonomic descriptions of only 13 Demospongiae species from Walters Shoal Seamount are given below. Of these, four are re-described from fresh material and nine are described as new (denoted as sp. •).

Phylum Porifera Grant, 1836

Class Demospongiae Sollas, 1885

Subclass Heteroscleromorpha Cárdenas, Perez & Boury-Esnault, 2012

Order Agelasida Hartman, 1980

Family Agelasidae Verrill, 1907

Genus *Agelas* Duchassaing & Michelotti, 1864

Agelas ceylonica **Dendy, 1905 (Fig. 7 A – F, Table 6)**

Synonymy

None.

Material examined. TS 2309 (WSL-INV47), TS 2313 (WSL-INV48), TS 2317 (WSL-INV46(2)): Walters Shoal Seamount, Grid WSL022, Station ALG10954, collected via sled (no 2) by the RV *Algoa*, (33°10.9' S; 43°48.6' E) - (33°11.2' S; 43°50.2' E), duration 41 min, depth 170 – 72 m, 29 May 2014. TS 2441 (WSL-INV74(7)), TS 2443 (WSL-INV74(9)), TS 2452 (WSL-INV74(18)), TS 2455 (WSL-INV74(21)), TS 2456 (WSL-INV74(22)), TS 2549 (WSL-INV74(31)): Walters Shoal Seamount, Grid WSL024, Station ALG10956, collected via sled (no 3) by the RV *Algoa*, (33°08.8' S; 43°49.1' E) - (33°09.0' S; 43°50.5' E), duration 33 min, depth 348 – 103 m, 29 May 2014.

Description. Repent-ramose form, which binds together with biogenic debris, creating a conglomerate (not shown). Length 6.5 cm, diameter 1.3 cm and thickness 0.7 cm. Surface rough and fuzzy, with small, randomly scattered oscules (round apertures), ranging from <1 mm – 1 mm in diameter. Consistency and texture is soft and spongy, compressible and not easily torn. Colour *in situ* brownish orange, pale orange in preservative.

Skeleton. Choanosomal skeleton comprises an isotropic reticulation consisting of a uniform network of spongin fibres, echinated by verticillate acanthostyles, with blunt ends embedded in the fibre. These fibres are also rarely cored with verticillate acanthostyles (embedded lengthwise in fibre). Ascending fibres usually echinated while transverse fibres not, but this is not always the case. Interconnecting transverse fibres are often uncored, and form irregular meshes of 30 – 100 µm in diameter. Spongin is sparsely scattered through the mesohyl. No ectosomal specialisation.

Spiculation. **Megascleres**. Verticillate acanthostyles in two size classes: I) 191.5 (163.9 – 216.5) x 9.0 (6.3 – 11.0) µm, n = 10, with 15 – 22 whorls of spines; II) 115.6 (89.6 – 148.0) x 4.3 (3.1 – 5.5) µm, n = 10, with 12 – 17 whorls of spines. **Microscleres**. Absent.

Substratum, Depth range and Ecology. Nine specimens found in two sleds, one which was dominated by hard live rock with many bivalves and sponges, the other host to predominantly dead shells and hydrozoans. Depth range: 72 – 348 m.

Geographic Distribution. Found extensively throughout the Indian Ocean, including Walters Shoal Seamount.

Remarks. The present material conforms well to *Agelas ceylonica*, which was described by Dendy (1905) from the Gulf of Mannar as consisting of 'a few slender, anastomosing, sub-cylindrical branches, arising from an irregular, proliferous basal crust attached to a calcareous nodule'. Dendy (1905) describe this species as having verticillate spined styles of approximately 240 x 20 µm, while Lévi (1961) describe specimens from the Seychelles as having two classes of 'acanthostyles' (I) 80 – 275 x 5 – 15 µm, with 16 – 21 whorls; II) 100 – 300 x 6 – 15 µm, with 13 – 23 whorls). The skeletal structure of *Agelas ceylonica* is also consistent with the material here, having a fibre network echinated by verticillate acanthostyles, with these also found occasionally embedded lengthwise in the fibre.

The descriptions of the other species of this genus found in the region of interest (Table 3): *Agelas bispiculata* Vacelet, Vasseur & Lévi,1976 (Verticillate acanthostyles: I) 320 – 400 x 14 – 17 µm, with 20 whorls; II) 55 – 120 x 6 – 10 µm, with 11 – 15 whorls), *Agelas marmarica* Lévi, 1958 (Verticillate acanthostyles: 230 x 10 µm, with 19 – 21 whorls) and *Agelas mauritiana* (Carter, 1883) (Verticillate acanthostyles according to Lévi (1961): 150 – 160 x 8 – 12 µm, with 16 – 20 whorls) also seem to be quite similar, especially with regards to morphology. However, the present material differs from the above due to the presence of very distinct, elongated spines on the smaller verticillate acanthostyles of these species, which also cover the head of the spicule, unlike those described here which have reduced spines and smooth heads.

Order Axinellida Lévi, 1953

Family Axinellidae Carter, 1875

Genus *Ptilocaulis* Carter, 1883

***Ptilocaulis* sp. • (Fig. 8 A – E, Table 7)**

Material examined. <u>TS 2440</u> (WSL-INV74(6)), <u>TS 2448</u> (WSL-INV74(14)), <u>TS 2546</u> (WSL-INV74(28)), <u>TS 2570</u> (WSL-INV74(52)): Walters Shoal Seamount, Grid WSL024, Station ALG10956, collected via sled (no 3) by the RV *Algoa*, (33°08.8' S; 43°49.1' E) - (33°09.0' S; 43°50.5' E), duration 33 min, depth 348 – 103 m, 29 May 2014. <u>TS 2458</u> (WSL-INV114(1)): Walters Shoal Seamount, Grid WSL047, Station ALG10979, collected via sled (no 9) by the RV *Algoa*, (33°09.7' S; 43°58.4' E) - (33°09.8' S; 43°57.0' E), duration 50 min, depth 512 – 317 m, 03 June 2014.

Description. Erect, dichotomously branching form, with few scopiform flattened processes. Length 3.1 cm, diameter 3.2 cm and thickness 0.4 cm. Surface irregular and finely hispid (due to protruding spicules) with small circular oscules (<1 mm) scattered throughout. Spicules protruding <1 mm from the surface, thus fuzzy to the touch. Texture soft and spongy, compressible and easily torn. Colour *in situ* off-white, white in preservative.

Skeleton. Choanosomal skeleton consists of a dense interwoven mass of sinuous styles cored in fascicles. All axial spicules are disposed longitudinally in a plumose fashion. Spicule tracts are sometimes definable for only a very short distance before becoming obscured in the general mass. The peripheral region is short and not well formed. Peripheral spicules arranged individually, or multiple spicules branch tangentially to the axis in a plumoreticulated fashion and ascend to, and usually protrude through, the ectosome. Styles in the axial and peripheral skeleton do not appear to be differentiated, but are irregularly arranged. Specialized ectosomal skeleton absent.

Spiculation. **Megascleres**. Styles, smooth, bent to sinuous, variable and hastate to somewhat blunt distally, no easily discernible size classes (continuous): 462.9 – 1332.8 x 18.8 (15.4 – 22.5) µm, n = 10. **Microscleres**. Absent.

Substratum, Depth range and Ecology. Five specimens found on rocky substrata in two sleds, predominantly composed of biogenic rubble, hydrozoans and rhodoliths. Depth range: 103 – 512 m.

Geographic Distribution. Walters Shoal Seamount.

Remarks. The present material conforms to *Ptilocaulis* Carter, 1883 as diagnosed by the presence of a vaguely reticulated axial skeleton and extra-axial skeleton formed by fibrofascicles cored with styles and ending in surface or scopiform processes which are distinctive for this genus (Alvarez & Hooper 2002). There are 11 currently accepted species of *Ptilocaulis* worldwide (van Soest *et al*. 2015), of which only one, *Ptilocaulis spiculifer* (Lamarck, 1814), occurs in the region of interest (Table 3).

Originally described by Lamarck in 1814, *P. spiculifer* has been recorded from Kenya by Pulitzer-Finali (1993). The latter author notes curved styles of one size class with faintly tylote bases (specimen one: 260 – 340 x 11.5 – 16 µm; specimen two: 230 – 290 x 9 – 14 µm). This was consistent with measurements from Ridley (1884): 350 x 19 µm and Dendy (1922): 300 x 12.3 µm. However, both Ridley (1884) and Dendy (1922) record the megascleres as having broadly rounded bases which is more consistent with the present material. Nonetheless, all re-descriptions of this species depict a much smaller spicule size range than that found for the present material, which thus likely constitutes a new species.

Order Haplosclerida Topsent, 1928

Family Callyspongiidae de Laubenfels, 1936

Genus *Callyspongia* Duchassaing & Michelotti, 1864

Subgenus *Callyspongia (Callyspongia)* Duchassaing & Michelotti, 1864

***Callyspongia (Callyspongia)* sp. • (Fig. 9 A – E, Table 8)**

Material examined. TS 2330 (WSL-INV94(1)), TS 2341 (WSL-INV94(13)), TS 2353 (WSL-INV94(25)): Walters Shoal Seamount, Grid WSL044, Station ALG10976, collected via sled (no 6) by the RV *Algoa*, (33°14.0' S; 43°55.5' E) - (33°13.7' S; 43°55.6' E), duration 9 min, depth 28 – 25 m, 02 June 2014. TS 2369 (WSL-INV75(10)), TS 2370 (WSL-INV75(11)), TS 2371 (WSL-INV75(12)): Walters Shoal Seamount, collected via SCUBA (dive 1) by the RV *Algoa*, duration 35 min, depth 29 m, 30 May 2014. TS 2382 (WSL-INV83(2)): Walters Shoal Seamount, collected via SCUBA (dive 2) by the RV *Algoa*, duration 36 min, depth 29 m, 30 May 2014. TS 2479 (WSL-INV84(8)): Walters Shoal Seamount, Grid WSL042, Station ALG10974, collected via sled (no 4) by the RV *Algoa*, (33°11.2' S; 43°51.0' E) - (33°11.2' S; 43°50.7' E), duration 10 min, depth 34 – 28 m, 02 June 2014. TS 2537 (WSL-INV102(3)): Walters Shoal Seamount, Grid WSL045, Station ALG10977, collected via sled (no 7) by the RV *Algoa*, (33°13.8' S; 43°56.1' E) - (33°14.2' S; 43°55.9' E), duration 16 min, depth 80 m, 02 June 2014.

Description. Massive, predominantly ramose but tubular, growing from a common base, from which upright clusters of finger-like projections arise, interconnected laterally. Tubes usually coalesced for a greater or lesser distance, occasionally united along entire length. Length 6.0 cm, diameter 9.1 cm and thickness 1.4 cm. Surface smooth and velvety to the touch. Oscules (3 – 9 mm diameter) present at the apex of the tubes, which become fibrous at the tips. Transparent membrane covering exterior. Texture soft and spongy, compressible and easily torn. Colour *in situ* bright blue, turning beige with purple tips above water. In preservative, pale yellow.

Skeleton. Choanosome with a regularly rectangular-meshed skeleton formed by multispicular primary spongin fibres ~30 µm wide, and ~71 – 430 µm apart, interconnected often perpendicularly by secondary unispicular fibres ~20 µm thick, forming meshes ~110 – 250 µm wide. Unispicular tertiary fibres sometimes present, ~25 µm thick, forming meshes ~80 µm thick, which interconnect secondary fibres perpendicularly. Specialised ectosomal skeleton absent, but primary fibres project as short, compact tufts of spicules beyond the exopinacoderm.

Spiculation. **Megascleres**. Oxeas, short, smooth, straight to slightly curved medially, hastate: 62.4 (56.6 – 68.8) x 3.0 (2.3 – 4.2) µm, n = 10. **Microscleres**. Absent

Substratum, Depth range and Ecology. Nine specimens found on rocky substrata in three sleds and both dives, often with crinoids as epifauna. Depth range: 25 – 80 m.

Geographic Distribution. Walters Shoal Seamount.

Remarks. The present material conforms to the genus *Callyspongia (Callyspongia)* Duchassaing & Michelotti, 1864 as diagnosed by a single ectosomal non-hispid layer, multispicular well-defined choanosomal fibres with a distinct spongin sheath, forming a rectangular mesh without free spicules, and a smooth surface (Desqueyroux-Faúndez & Valentine 2002).

The present material does not seem conspecific with the three species of this genus that have been recorded from the region of interest (Table 3): *Callyspongia (Callyspongia) differentiata* (Dendy, 1922), *Callyspongia (Callyspongia) reticutis* (Dendy, 1905) and *Callyspongia (Callyspongia) tubulosa* sensu (Esper, 1797), the latter of which was re-described by Samaai & Gibbons in 2005. Both *C. (C.) differentiata* and *C. (C.) reticutis* have slightly larger spicule sizes (80 x 3 µm and 72 x 2.6 µm respectively) but also differ to the present material with regards to skeletal structure, with the former having secondary fibres devoid of spicules and the latter having multispicular secondary fibres. *Callyspongia (C.) tubulosa* is most similar morphologically to the present material, but has larger oxeas (110 –

140 x 13 µm) with multispicular secondary fibres. Thus, the present material likely constitutes a new species.

Order Poecilosclerida Topsent, 1928

Family Coelosphaeridae Dendy, 1922

Genus *Lissodendoryx* Topsent, 1892

Subgenus *Lissodendoryx (Lissodendoryx)* Topsent, 1892

***Lissodendoryx (Lissodendoryx) pygmaea* (Burton, 1931) (Fig. 10 A – I, Table 9)**

Synonymy

Myxilla pygmaea Burton, 1931: p. 342, Pl. XXIII, Fig. 1.

Material examined. TS 2364 (WSL-INV75(5)), TS 2365 (WSL-INV75(6)), TS 2366 (WSL-INV75(7)), TS 2367 (WSL-INV75(8)), TS 2368 (WSL-INV75(9)): Walters Shoal Seamount, collected via SCUBA (dive 1) by the RV *Algoa*, (33°11.2' S; 43°50.7' E), duration 35 min, depth 29 m, 30 May 2014.

Description. Massive, ridge-shaped form. Length 13.0 cm, diameter 7.5 cm and thickness 2.6 cm. Surface smooth and uneven, or markedly coarse with a thin, transparent membrane covering the entire exterior. Oscules (up to 5 mm in size) present, scattered randomly on top of the ridge. Texture firm but spongy, compressible and not easily torn. Colour *in situ* light red to orange externally, pale yellow internally. In preservative, beige.

Skeleton. Choanosomal skeleton comprises a fairly tight-meshed regular reneroid reticulation, with primary fibres ~40 µm across, running obliquely to the surface, composed of spongin and cored by groups of 1 – 3 smooth styles, diverging in a plumoreticulate manner to ectosome. Secondary fibres ~20 – 30 µm across, enter the primary fibres at an angle, cored by single styles. Primary and secondary fibres with spongin, without a distinct sheath. Ectosomal skeleton comprises a distinct and continuous palisade of tylotes, perpendicular to and penetrating the surface, sometimes forming radiating bouquets ~150 – 200 µm deep. Microscleres scattered throughout.

Spiculation. **Megascleres**. Ectosomal tylotes, smooth, straight shafted, with elongated, well-developed heads: 181.5 (164.4 – 196.4) x 4.5 (3.5 – 5.1) µm, n = 10. Styles smooth, slightly curved with pronounced shaft and hastate end: 125.6 (116.8 – 137.5) x 6.0 (4.4 – 6.8) µm, n = 10. **Microscleres**. Sigmas, both C- and S-shaped: 28.6 (26.4 – 31.1) µm, n = 10. Arcuate isochelae in two size classes: I) 23.8 (22.4 – 25.0) µm, n = 10; II) 13.2 (12.1 – 14.1) µm, n = 10.

Substratum, Depth range and Ecology. Five specimens found on rocky substrata during a dive, with crinoids as epifauna. Depth: 29 m.

Geographic Distribution. KwaZulu-Natal (South Africa), Walters Shoal Seamount.

Remarks. The present material conforms to *Lissodendoryx (Lissodendoryx) pygmaea* (Burton, 1931), originally described as *Myxilla pygmaea* (Tylotes: 150 x 6 µm; Styles: 105 x 4 µm; Sigmas: 21 – 27 µm; Chelae: I) 21 – 27 µm, II) 12 µm). However, the present material has slightly longer megascleres. Burton (1931) noted that the erected species may be allied with, or identical to, *Lissodendoryx (Lissodendoryx) isodictyalis* (Carter, 1882), but disregarded this notion due to the latter species' distribution. *Lissodendoryx (L.) pygmaea* was also noted by Lévi (1963, 1969) to resemble the type specimen of *Lissodendoryx (Lissodendoryx) ternatensis* (Thiele, 1903) from Ternate, and a specimen from Vema Seamount (off South Africa) which he described as the latter species. Hofman & van Soest (1995) suggest that *L. (L.) pygmaea* may possibly be a closely related, but separate, species to *L. (L.) ternatensis*, with the latter species having two classes of sigmas (as does *L. (L.) isodictyalis*). However, both Lévi (1963, 1969) and Samaai & Gibbons (2005) note only one category of sigmas for *L. (L.) ternatensis*.

Although the descriptions of *L. (L.) ternatensis* by Lévi (1963, 1969) conform well to the present material, it has been placed conservatively here under *L. (L.) pygmaea* based on the taxonomic ambiguities and disjunct distribution of *L. (L.) ternatensis*. Obviously, the species that comprise *Lissodendoryx (Lissodendoryx)* in South Africa, and farther afield, are in need of further investigation.

Family Dendoricellidae Hentschel, 1923

Genus *Fibulia* Carter, 1886

***Fibulia ectofibrosa* (Lévi, 1963) (Fig. 11 A – E, Table 10)**

Synonymy

Desmacidon ectofibrosa Lévi, 1963: p. 26, Fig. 27, Pl. IV A, B.

Fibula ectyofibrosa Samaai & Gibbons, 2005: p. 57, Figs. 4G, 41 A – C.

Material examined. TS 2303 (WSL-INV55): Walters Shoal Seamount, Grid WSL022, Station ALG10954, collected via sled (no 2) by the RV *Algoa*, (33°10.9' S; 43°48.6' E) - (33°11.2' S; 43°50.2' E), duration 41 min, depth 170 – 72 m, 29 May 2014. TS 2472 (WSL-INV84(1)), TS 2473 (WSL-INV84(2)), TS 2477 (WSL-INV84(6)), TS 2487

(WSL-INV84(16)), TS 2497 (WSL-INV84(26)), TS 2510 (WSL-INV84(39)): Walters Shoal Seamount, Grid WSL042, Station ALG10974, collected via sled (no 4) by the RV *Algoa*, (33°11.2' S; 43°51.0' E) - (33°11.2' S; 43°50.7' E), duration 10 min, depth 34 – 28 m, 02 June 2014.

Description. Thickly encrusting and amorphous form. Length 3.8 cm, diameter 3.0 cm and thickness 1.1 cm. Surface smooth and slippery, with ridges and randomly scattered oscules. Oscules are non-circular, ~1 – 2 mm in diameter, often slightly indented. Texture rubbery, firm and dense. Specimen not compressible, nor easily torn. In one specimen (TS 2303), bright orange-red spherical eggs (~1 mm diameter) present. Colour *in situ* dark red, light brown in preservative. Preservative becomes bright orange with time. Most specimens leave a red-brown exudate on tissue paper.

Skeleton. Choanosome contains a multispicular reticulate skeleton, comprised of robust fibres arranged somewhat radially, cored with oxeas. Fibres ~100 µm thick, sinuous, running somewhat perpendicular to the surface, not differentiated into primary and secondary tracts. Oxeas and arcuate chelae scattered throughout. Fibres penetrate ectosome, expanding radially to form brushes. Ectosome contains erect, radial bouquets of oxeas that sometimes pierce the surface, <200 µm thick.

Spiculation. **Megascleres**. Oxeas hastate, tornote-like, smooth, straight or slightly curved: 316.2 (282.3 – 342.3) x 6.2 (4.2 – 7.7) µm, n = 10. **Microscleres**. Arcuate unguiferous isochelae: 13.9 (12.4 – 15.4) µm, n = 10.

Substratum, Depth range and Ecology. Seven specimens found on rocky substrata in two sleds, almost always in association with the same species of hydroid as epifauna. Depth range: 28 – 170 m.

Geographic Distribution. South African Exclusive Economic Zone, Walters Shoal Seamount.

Remarks. The present material conforms to both the original description of *Desmacidon ectofibrosa* by Lévi (1963) and genus reassignment to *Fibula ectyofibrosa* (Oxeas: 353 (318 – 382) x 14 (14) µm, n = 10; Chelae: 18 (18) µm, n = 10) by Samaai & Gibbons (2005). However, in both cases, the material presented here was found to have a slightly smaller megasclere width when compared to the descriptions above, and slightly smaller chelae. *Desmacidon ectofibrosa* Lévi, 1963 was thought to be misplaced (and thus reassigned) by Samaai & Gibbons (2005) based on the presence of arcuate chelae, which would suggest the genus *Fibulia*, rather than *Desmacidon*, which has anchorate chelae (van Soest 2002a). According to the World Porifera Database (May 2015, van Soest *et al.* 2015), this species was reassigned to the genus *Isodictya*, but with no reference mentioned. As *Isodictya* has palmate isochelae, this reassignment seems misplaced. Thus, the current material is considered here a species of the genus *Fibulia*. According to Samaai & Gibbons (2005), this species is common along the west coast of South Africa and exhibits a variety of growth forms.

Family Latrunculiidae Topsent, 1922

Genus *Latrunculia* du Bocage, 1869

Subgenus *Latrunculia (Biannulata)* Samaai, Gibbons & Kelly, 2006

***Latrunculia (Biannulata)* sp. • (Fig. 12 A – F)**

Material examined. TS 2563 (WSL-INV74(45)): Walters Shoal Seamount, Grid WSL024, Station ALG10956, collected via sled (no 3) by the RV *Algoa*, (33°08.8' S; 43°49.1' E) - (33°09.0' S; 43°50.5' E), duration 33 min, depth 348 – 103 m, 29 May 2014.

Description. Thinly encrusting form on biogenic rubble. Length 2.0 cm, diameter 1.9 cm and thickness <0.1 cm. Surface slightly rough (probably due to the texture of the rock), with very small areolate porefields, 0.2 mm in diameter. Not compressible, easily torn. Colour *in situ*, and in preservative, black.

Skeleton. Choanosomal skeleton comprises an irregular polygonal reticulation formed by wispy tracts of smooth styles. The tracts range in width from 60 – 90 µm and form meshes that are 150 µm wide. Within the inner choanosome, tracts diverge towards the surface. Interstitial spicules present. Ectosome comprises a palisade of densely packed, interlocking anisodiscorhabds arranged vertically one spicule deep with their basal spinose whorls buried in the outer ectosomal membrane.

Spiculation. Megascleres. Styles smooth, polytylote, straight or slightly sinuous with elongated heads, often distally tornote: 263.5 (236.6 – 290.7) x 5.6 (4.7 – 6.6) µm, n = 10. **Microscleres**. Anisodiscorhabds with well separated furcate whorls and hooked spines. Shaft occasionally spined with undifferentiated basal whorl and manubrium: 39.6 (36.6 – 42.3) x 4.5 (3.6 – 5.0) µm, width including whorls: 22.3 (19.3 – 24.3) µm, n = 10.

Substratum, Depth range and Ecology. One specimen found on rocky substrata in a single sled composed predominantly of dead clam shells and hydrozoans. Depth range: 103 – 348 m.

Geographic Distribution. Walters Shoal Seamount.

Remarks. The present material conforms to *Latrunculia* du Bocage, 1869 as diagnosed by the presence of anisodiscorhabd microscleres (Samaai & Kelly 2002). In this material, the microscleres have two whorls (mean and subsidiary) of spines on the shaft which suggests placement in the subgenus *Latrunculia (Biannulata)* Samaai, Gibbons & Kelly, 2006 (Samaai *et al*. 2006). This placement is supported by Dr Toufiek Samaai (personal communication, April 1, 2015).

The present material is not conspecific with the five species of *Latrunculia (Biannulata)* that have been recorded from the region of interest (Table 3): *Latrunculia (Biannulata) algoaensis* Samaai, Janson & Kelly, 2012; *Latrunculia (Biannulata) gotzi* Samaai, Janson & Kelly, 2012; *Latrunculia (Biannulata) kerwathi* Samaai, Janson & Kelly, 2012; *Latrunculia (Biannulata) lunaviridis* Samaai, Gibbons, Kelly & Davies-Coleman, 2003 and *Latrunculia (Biannulata) microacanthoxea* Samaai, Gibbons, Kelly & Davies-Coleman, 2003. Apart from *L. (B.) kerwathi*, which is thinly encrusting, all the other species have either a thickly encrusting or massive semi-spherical form, often with volcano or cylindrical shaped oscules. In addition, all the above species have microscleres that are visually distinct to those found in the present material, which lacks a crown-like tuft of spines forming the apical whorl and manubrium. Thus the present material likely constitutes a new species.

Family Microcionidae Carter, 1875

Subfamily Microcioninae Carter, 1875

Genus *Clathria* Schmidt, 1862

Subgenus *Clathria (Clathria)* Schmidt, 1862

***Clathria (Clathria)* sp. • (Fig. 13 A – K, Table 11)**

Material examined. TS 2302 (WSL-INV54): Walters Shoal Seamount, Grid WSL022, Station ALG10954, collected via sled (no 2) by the RV *Algoa*, (33°10.9' S; 43°48.6' E) - (33°11.2' S; 43°50.2' E), duration 41 min, depth 170 – 72 m, 29 May 2014. TS 2342 (WSL-INV94(14)), TS 2348 (WSL-INV94(20)), TS 2355 (WSL-INV94(27)): Walters Shoal Seamount, Grid WSL044, Station ALG10976, collected via sled (no 6) by the RV *Algoa*, (33°14.0' S; 43°55.5' E) - (33°13.7' S; 43°55.6' E), duration 9 min, depth 28 – 25 m, 02 June 2014. TS 2399 (WSL-INV92(10)), TS 2422 (WSL-INV92(11)): Walters Shoal Seamount, Grid WSL043, Station ALG10975, collected via sled (no 5) by the RV *Algoa*, (33°13.8' S; 43°55.5' E) - (33°13.1' S; 43°55.8' E), duration 11 min, depth 28 – 30 m, 02 June 2014. TS 2508 (WSL-INV84(37)), TS 2511 (WSL-INV84(40)): Walters Shoal Seamount, Grid WSL042, Station ALG10974, collected via sled (no 4) by the RV *Algoa*, (33°11.2' S; 43°51.0' E) - (33°11.2' S; 43°50.7' E), duration 10 min, depth 34 – 28 m, 02 June 2014.

Description. Thickly encrusting, lobate form. Length 3.4 cm, diameter 2.5 cm and thickness 1.3 cm. Surface undulating but smooth and velvety, with randomly scattered small, round oscules (<1 mm in diameter), sunken with no distinct membranous lip. Texture soft and spongy, compressible and easily torn. Colour *in situ* orange, beige in preservative.

Skeleton. Choanosomal skeleton regularly reticulate, forming irregular anastomoses of differentiated primary and secondary fibres, diverging in plumoreticulate manner towards ectosome. Fibres are differentiated into primary and secondary transverse components. Primary fibres cored with principal styles, cemented by spongin that does not form a distinct sheath around the fibre and echinated by acanthostyles. Secondary fibres with unispicular tracts of principal styles. Ectosomal and subectosomal skeleton comprised of principal styles and auxiliary subtylostyles, with the former arising from ascending choanosomal tracts being slightly plumose and diverging into erect bundles which project obliquely through the surface. The latter form compact diverging brushes at the ectosomal surface, barely penetrating the subectosomal membrane. Microscleres scattered throughout choanosome.

Spiculation. Megascleres. Styles, smooth, curved, with well-rounded to almost subtylote-like base, distally hastate: 234.3 (178.7 – 320.0) x 9.3 (7.9 – 11.5) µm, n = 10. Subtylostyles, smooth, straight with terminally spined elongated base, distally fusiform: 211.4 (129.7 – 313.1) x 3.0 (2.4 – 3.8) µm, n = 10. Acanthostyles, straight to slightly bent, with well-rounded to almost subtylote-like base, distally hastate: 138.0 (132.2 – 148.0) x 7.3 (5.6 – 9.7) µm, n = 10. **Microscleres**. Toxas, terminally spined, in two size classes: I) 146.1 (111.0 – 177.2) µm, n = 10; II) 45.1 (35.3 – 61.1) µm, n = 10. Palmate isochelae: 12.5 (11.2 – 14.2) µm, n = 10.

Substratum, Depth range and Ecology. Eight specimens found on rocky substrata in four sleds. Depth range: 25 – 170 m.

Geographic Distribution. Walters Shoal Seamount.

Remarks. The present material conforms to *Clathria (Clathria)* Schmidt, 1862 as diagnosed by a single category of auxiliary style and no marked difference between the axial and extra-axial regions in the choanosomal skeleton (Hooper 2002). There are 26 species of *Clathria (Clathria)* found within the region of interest (Table 3), none of which seem conspecific with the material here.

Of these 26 species, three are similar to the present material, including *Clathria (Clathria) dayi* Lévi, 1963; *Clathria (Clathria) oculata* Burton, 1933 and *Clathria (Clathria) inhacensis* Thomas, 1979. *Clathria (Clathria) dayi* (Styles: 300 – 525 x 25 – 30 µm; Auxiliary styles: 175 – 280 x 4 – 6 µm; Acanthostyles: 225 – 300 x 15 – 25 µm; Toxas: 175 – 300 x 2 – 5 µm; Chelae: 5 – 7 µ) is found within the southern African Exclusive Economic Zone and has similar spicules to the present material. However, Lévi (1963) records spicules which are larger and thicker than the material here, with unspined auxiliary styles and only one class of toxa. Alternatively, *C. (C.) oculata* (Styles: 140 x 7µm; Auxiliary styles: 160 x 3 µm; Acanthostyles: 65 x 4µm; Toxas: 160 µm; Chelae: 6 µm) has slightly smaller and narrower spicule sizes, but also has unspined auxiliary styles and only one class of smooth toxa. This is also true for *C. (C.) inhacensis* (Styles: 121 – 172 (142) x 4 – 5 (4) µm; Auxiliary styles: 124 – 181 (144) x 2 – 4 (3) µm; Acanthostyles: 41 – 58 (50) x 3 – 5 µm; Toxas: 120 µm; Chelae: 8 – 10 µm), which has one class of hair-like toxa. Thus, the present material likely constitutes a new species.

Order Suberitida Chombard & Boury-Esnault, 1999

Family Halichondriidae Gray, 1867

Genus *Halichondria* Fleming, 1828

Subgenus *Halichondria (Halichondria)* Fleming, 1828

***Halichondria (Halichondria)* sp. • (Fig. 14 A – F, Table 12)**

Material examined. TS 2336 (WSL-INV94(7)), TS 2338 (WSL-INV94(10)), TS 2339 (WSL-INV94(11)), TS 2340 (WSL-INV94(12)), TS 2350 (WSL-INV94(22)): Walters Shoal Seamount, Grid WSL044, Station ALG10976, collected via sled (no 6) by the RV *Algoa*, (33°14.0' S; 43°55.5' E) - (33°13.7' S; 43°55.6' E), duration 9 min, depth 28 – 25 m, 02 June 2014. TS 2373 (WSL-INV75(14)), TS 2374 (WSL-INV75(15)), TS 2375 (WSL-INV75(16)), TS 2377 (WSL-INV75(18)), TS 2378 (WSL-INV75(19)), TS 2379 (WSL-INV75(20)), TS 2380 (WSL-INV75(21)): Walters Shoal Seamount, collected via SCUBA (dive 1) by the RV *Algoa*, (33°11.2' S; 43°50.7' E), duration 35 min, depth 29 m, 30 May 2014. TS 2381 (WSL-INV83(1)), TS 2383 (WSL-INV83(3)), TS 2384 (WSL-INV83(4)), TS 2385 (WSL-INV83(5)), TS 2387 (WSL-INV83(7)): Walters Shoal Seamount, collected via SCUBA (dive 2) by the RV *Algoa*, (33°10.6' S; 43°51.0' E), duration 36 min, depth 29 m, 30 May 2014. TS 2390 (WSL-INV92(1)), TS 2391 (WSL-INV92(2)), TS 2392 (WSL-INV92(3)), TS 2393 (WSL-INV92(4)): Walters Shoal Seamount, Grid WSL043, Station ALG10975, collected via sled (no 5) by the RV *Algoa*, (33°13.8' S; 43°55.5' E) - (33°13.1' S; 43°55.8' E), duration 11 min, depth 28 – 30 m, 02 June 2014. TS 2481 (WSL-INV84(10)), TS 2482 (WSL-INV84(11)), TS 2483 (WSL-INV84(12)), TS 2484 (WSL-INV84(13)), TS 2485 (WSL-INV84(14)), TS 2486 (WSL-INV84(15)), TS 2490 (WSL-INV84(19)), TS 2492 (WSL-INV84(21)), TS 2499 (WSL-INV84(28)): Walters Shoal Seamount, Grid WSL042, Station ALG10974, collected via sled (no 4) by the RV *Algoa*, (33°11.2' S; 43°51.0' E) - (33°11.2' S; 43°50.7' E), duration 10 min, depth 34 – 28 m, 02 June 2014.

Description. Thickly encrusting, semi-spherical form. Length 5.0 cm, diameter 4.0 cm and thickness 2.5 cm. Surface smooth, uneven, with various ridge-like structures, and covered with small volcano-shaped papillae. Oscules (1 – 2 mm) scattered randomly on the upper surface, also occurring on the apex of volcano-shaped papillae (which become depressed above water) in other specimens (e.g. TS 2338). Membrane present that covers the exterior. Texture spongy and dense, of medium compressibility and easily torn. Colour *in situ* dark brown, with very dark brown (almost black) regions, light brown with dark brown regions in preservative. Specimen smells like soil and leaves a brown exudate on tissue paper.

Skeleton. Confused choanosomal skeleton, typically halichondrid, with oxeas of variable length arranged in a disorderly fashion (spicules distributed randomly), showing little tendency to form ascending tracts, and separated by well-developed subdermal spaces. The ectosomal skeleton typically comprises a tangential spicule layer of varying thickness (~100 – 300 μm), often becoming confused via intercrossing spicules. Spicules do not penetrate the surface. Ectosome not readily detachable from choanosome.

Spiculation. **Megascleres**. Oxeas, smooth, straight to slightly curved, fusiform, in three size classes: I) 403.3 (349.9 – 461.6) x 9.9 (6.2 – 13.6) μm, n = 10; II) 232.0 (208.0 – 288.4) x 7.7 (5.7 – 9.2) μm, n = 10; III) 145.3 (112.5 – 198.6) x 6.1 (5.0 – 7.4) μm, n = 10. **Microscleres**. Absent.

Substratum, Depth range and Ecology. Thirty specimens found on rocky substrata in three sleds and both dives, with ascidians, tube worms, coralline algae and/or hydroids as epifauna. Depth range: 25 – 34 m.

Geographic Distribution. Walters Shoal Seamount.

Remarks. The present material has a typically halichondrid skeleton (Erpenbeck & van Soest 2002), megascleres that are exclusively oxeas, as well as oscules on conical elevations, and is thus placed in the genus *Halichondria* Fleming, 1828. It does not seem to be conspecific with the seven species of *Halichondria (Halichondria)* Fleming, 1828 that have been recorded from the region of interest (Table 3), based on morphology and the presence of three size classes of oxeas.

Halichondria (Halichondria) capensis and *Halichondria (Halichondria) gilvus*, both described by Samaai & Gibbons (2005) from the west coast of South Africa, and *Halichondria* (*Halichondria*) *prostrata* Thiele, 1905 from Antarctica, have one size class of oxeas (333 (319 – 355) x 12 (12) µm, n = 10; 391 (328 – 437) x 15 (9 – 18) µm, n = 10 and 300 – 320 x 9 µm respectively) with a relatively narrow size range. In addition, both *H.* (*H.*) *capensis* and *H.* (*H.*) *gilvus* have conspicuous papillae, as opposed to the present material which has irregular, spongy, easily deformed turrets. Within the Western Indian Ocean, *Halichondria* (*Halichondria*) *cartilaginea* (Esper, 1794) and *Halichondria* (*Halichondria*) *lendenfeldi* Lévi, 1961 also both have one size class of oxeas (185 – 203 x 3 – 4 µm; 400 – 600 x 11 – 13 µm respectively). These two species also differ from the present material morphologically, with *H.* (*H.*) *cartilaginea* having a bushy form, with a slightly brittle consistency and small (0.02 mm) pores, while *H.* (*H.*) *lendenfeldi* has a hispid, velvety surface with many pores distributed over the entire surface. *Halichondria* (*Halichondria*) *aldabrensis* Lévi, 1961 has two size classes of oxeas (I) 275 – 650 x 4 – 10 µm; II) 650 – 950 x 10 – 30 µm), which are larger than those found in the present material. Finally, *Halichondria* (*Halichondria*) *tenuiramosa* Dendy, 1922 which occurs extensively in the Indian Ocean, has one size class of very small oxeas (210 x 6 µm), with a creeping, branching form. Thus, the present material likely constitutes a new species.

Family Suberitidae Schmidt, 1870

Genus *Aaptos* Gray, 1867

***Aaptos* sp. • (Fig. 15 A – H, Table 13)**

Material examined. TS 2502 (WSL-INV84(31)), TS 2503 (WSL-INV84(32)): Walters Shoal Seamount, Grid WSL042, Station ALG10974, collected via sled (no 4) by the RV *Algoa*, (33°11.2' S; 43°51.0' E) - (33°11.2' S; 43°50.7' E), duration 10 min, depth 34 – 28 m, 02 June 2014.

Description. Thickly encrusting form. Length 1.9 cm, diameter 1.7 cm and thickness 0.7 cm. A dense array of spicules at the surface (~1 mm), arranged in a confused fashion rendering the surface prickly to the touch. No visible oscules. Texture dense and firm, barely compressible specimens tear so-so. Colour *in situ* dull black externally, almost appearing grey due to visible spicules at the surface. Internal colour *in situ* beige. Colour in preservative dull brown externally, internally grey-beige.

Skeleton. Choanosomal skeleton comprises dense tracts of megascleres (~230 – 290 µm wide) that arise from the base and radiate vertically through the choanosome, fanning out and forming brushes into the ectosome. These brushes form a dense palisade at the surface, with smaller spicules intermingled (often perpendicular to surface) between the larger spicules. Subectosomal region consists of a layer of densely packed, tangentially orientated megascleres. Ectosome consists of small styles and larger intermediate styles, which form palisades of vertically arranged brushes. The distal ends of these megascleres protrude through sponge surface.

Spiculation. **Megascleres**. Strongyloxeas, smooth, straight to slightly bent, thickest centrally with reduced apices, distally fusiform: 954.4 (677.5 – 1284.6) x 14.1 (7.5 – 20.0) µm, n = 10. Styles, smooth, straight to slightly bent, often thickest centrally in largest size class, distally fusiform, in three size classes: I) 875.8 (674.1 – 1252.4) x 27.4 (23.6 – 32.3) µm, n = 10; II) 446.0 (348.3 – 576.4) x 14.9 (8.9 – 19.7) µm, n = 10; III) 188.3 (127.5 – 291.1) x 5.0 (3.0 – 6.9) µm, n = 10. **Microscleres**. Absent.

Substratum, Depth range and Ecology. Two specimens found in one sled on rocky substrate. Depth range: 28 – 34 m.

Geographic Distribution. Walters Shoal Seamount.

Remarks. The present material has a radiate skeleton of strongyloxeas, with a dense ectosomal palisade and is thus placed in the genus *Aaptos* Gray, 1867 (van Soest 2002b). It does not seem to be conspecific with the two species of *Aaptos* that have been recorded from the region of interest (Table 3), including *Aaptos alphiensis* Samaai & Gibbons, 2005 and *Aaptos nuda* (Kirkpatrick, 1903). *Aaptos alphiensis* was described by Samaai & Gibbons (2005) from the west coast of South Africa, as having both primary and intermediate subtylostyles, intermediate styles and dermal tylostyles, while Kirkpatrick (1903) notes the presence of only oxeas in *A. nuda*.

There have been several records of *Aaptos aaptos* (Schmidt, 1864), which has both strongyloxeas and styles, within the region of interest. However, the World Porifera Database (van Soest *et al*. 2015) suggests these records are inaccurate due to the geographic distribution of this species which has been reported from many areas around the world. Thus, the present material likely constitutes a new species.

Order Tethyida Morrow & Cárdenas, 2015

Family Tethyidae Gray, 1848

Genus *Tethya* Lamarck, 1815

***Tethya* sp. • (Fig. 16 A – G, Table 14)**

Material examined. TS 2311 (WSL-INV50(2)), TS 2327 (WSL-INV40): Walters Shoal Seamount, Grid WSL022, Station ALG10954, collected via sled (no 2) by the RV *Algoa*, (33°10.9' S; 43°48.6' E) - (33°11.2' S; 43°50.2' E), duration 41 min, depth 170 – 72 m, 29 May 2014. TS 2337 (WSL-INV94(8)), TS 2349 (WSL-INV94(21)), TS 2352 (WSL-INV94(24)), TS 2358 (WSL-INV94(30)): Walters Shoal Seamount, Grid WSL044, Station ALG10976, collected via sled (no 6) by the RV *Algoa*, (33°14.0' S; 43°55.5' E) - (33°13.7' S; 43°55.6' E), duration 9 min, depth 28 - 25m, 02 June 2014. TS 2362 (WSL-INV75(3)), TS 2363 (WSL-INV75(4)), TS 2376 (WSL-INV75(17)): Walters Shoal Seamount, collected via dive (no 1) by the RV *Algoa*, (33°11.2' S; 43°50.7' E), duration 35 min, depth 29 m, 30 May 2014. TS 2420 (WSL-INV24(a)): Walters Shoal Seamount, Grid WSL021, Station ALG10953, collected via sled (no 1) by the RV *Algoa*, (33°11.0' S; 43°53.9' E) - (33°11.0' S; 43°52.9' E), duration 40 min, depth 53 – 43 m, 29 May 2014. TS 2430 (WSL-INV119(4)): Walters Shoal Seamount, collected via lobster trap by the RV *Algoa*, (33°11.6' S; 43°50.5' E), duration 328 min, depth 39 m, 05 June 2014. TS 2474 (WSL-INV84(3)), TS 2489 (WSL-INV84(18)), TS 2493 (WSL-INV84(22)), TS 2496 (WSL-INV84(25)), TS 2498 (WSL-INV84(27)): Walters Shoal Seamount, Grid WSL042, Station ALG10974, collected via sled (no 4) by the RV *Algoa*, (33°11.2' S; 43°51.0' E) - (33°11.2' S; 43°50.7' E), duration 10 min, depth 34 – 28 m, 02 June 2014. TS 2538 (WSL-INV102(4)): Walters Shoal Seamount, Grid

WSL045, Station ALG10977, collected via sled (no 7) by the RV *Algoa*, (33°13.8' S; 43°56.1' E) - (33°14.2' S; 43°55.9' E), duration 16 min, depth 80 m, 02 June 2014.

Description. Spherical to semi-spherical form. Length 1.6 cm, diameter 1.4 cm and thickness 1.4 cm. Surface rough and fuzzy, but undulating and smooth in a couple of specimens. In other specimens, one (rarely two) oscules present on apex (~1 mm). Well-developed ectosome, ~1 – 2 mm thick, which is distinct but not separable from the choanosome. Texture tough, firm and dense. Not compressible, nor easily torn. Colour *in situ* pale beige (with brown tinge) externally, olive green internally, with a white centre. In preservative, pale beige. Ectosome colour *in situ*, and in preservative, white. Slightly sticky exudate present in a few specimens.

Skeleton. Choanosomal skeleton radial, comprising compact anisostrongyloxea and (aniso)strongyle (rare) tracts (~200 µm across) radiating from the centre of the sponge, often penetrating the ectosome as expanding dermal brushes, with megascleres piercing the sponge surface. Somewhat confused interstitial anisostrongyloxeas fill the space among the main megasclere bundles. Microscleres are common in the inner choanosome between the tracts. Thick, discernible ectosome (>1000 µm) comprised of small radial bouquets (~400 – 600 µm across) of megascleres embedded within this region, which pierce the sponge surface. Megasters (represented by spherasters) and micrasters are densely packed in ectosome, somewhat entering the upper regions of the choanosome, with the former decreasing in size from the sponge surface, inwards.

Spiculation. **Megascleres**. Primary and auxiliary anisostrongyloxeas, smooth, straight, thickest centrally, with reduced, somewhat elongate apices, often distally hastate, with no easily discernible size classes (continuous) and large size range: 292.7 – 1280.1 x 10.5 (5.6 – 22.7) µm, n = 10. Strongyles to anisostrongyles, relatively rare, smooth, straight, thickest centrally, often fusiform, with no easily discernible size class: 995.6 (595.6 – 1249.3) x 19.2 (9.0 – 24.9) µm, n = 10. **Microscleres**. Megasters - Spherasters with ~15 rays: 37.0 (21.3 – 56.0) µm, n = 10. Micrasters - Tylasters with ~11 terminally spined rays: 12.6 (10.5 – 15.1) µm, n = 10; Spheroxyasters with ~8 rays: 6.2 (5.3 – 7.0) µm, n = 10.

Substratum, Depth range and Ecology. Seventeen specimens found on rocky substratum in five sleds, in the lobster trap and during one dive. This species found in association with tube worms, bivalves and algae (in the form of epifauna). Depth range: 25 – 170 m.

Geographic Distribution. Walters Shoal Seamount.

Remarks. The present material conforms well to *Tethya* Lamarck, 1815, as diagnosed by a spherical form, well-developed, distinct ectosome and main skeleton formed by radiating strongyloexa bundles (Sarà 2002). It does not seem to be conspecific with the nine species of *Tethya* that have been recorded from the region of interest (Table 3): *Tethya globostellata* Lendenfeld, 1897; *Tethya japonica* Sollas, 1888; *Tethya magna* Kirkpatrick, 1903; *Tethya parvistella* (Baer, 1906); *Tethya peracuta* (Topsent, 1918); *Tethya robusta* (Bowerbank, 1873); *Tethya rubra* Samaai & Gibbons, 2005; *Tethya seychellensis* (Wright, 1881) and *Tethya stellagrandis* (Dendy, 1916).

Tethya globostellata Lendenfeld, 1897 (Anisostrongyloxeas: 1000 – 2100 x 24 – 32 µm; Styles: 400 – 500 x 14 – 16 µm; Amphistrongyles: 1000 – 1500 x 33 µm; Oxyasters: 60 – 100 µm; Strongylasters: 9 – 12 µm) and *T. parvistella* (Baer, 1906)

(Anisostrongyloxeas: 718 – 1342 x 3 – 18 µm; Amphistrongyles: 841 – 1100 x 14 – 18 µm; Sphaerasters: 33 – 59 µm; Tylasters: I) 7 µm, II) 11 µm) somewhat resemble the present material. However, all the above-mentioned species lack the smallest spheroxyasters. Thus, the present material likely constitutes a new species.

Order Tetractinellida Marshall, 1876

Suborder Astrophorina Sollas, 1887

Family Ancorinidae Schmidt, 1870

Genus *Ancorina* Schmidt, 1862

***Ancorina* sp. • (Fig. 17 A – L, Table 15)**

Material examined. TS 2475 (WSL-INV84(4)), TS 2476 (WSL-INV84(5)): Walters Shoal Seamount, Grid WSL042, Station ALG10974, collected via sled (no 4) by the RV *Algoa* (Voyage 208), (33°11.2' S; 43°51.0' E) - (33°11.2' S; 43°50.7' E), duration 10 min, depth 34 – 28 m, 02 June 2014.

Description. Massive, amorphous form. Length 9.4 cm, diameter 5.6 cm and thickness 3.4 cm. Surface microhispid, and thus prickly to the touch. A few oscules evident on the ridge (0.5 – 1 mm) and several (1 – 2 mm) on the underside of specimen TS 2476. Texture firm, dense and slightly rubbery. Barely compressible, not easily torn. Ectosome (~2 mm) present, not separable from the choanosome and yellow *in situ*, white in preservative. Colour *in situ* dark brown with yellowish tinge and darker brown, almost black ridges externally and paler brown internally. In preservative, dark brown externally and paler brown internally. Water retentive, leaving a brown exudate on tissue paper.

Skeleton. Choanosomal skeleton consists of radiating tracts of plagiotriaenes and oxeas. Tracts of large oxeas occur between the plagiotriaenes in mid- and deep choanosomal layers of the sponge. Oxyasters abundant and scattered throughout. Towards the surface, the tracts become denser and are entirely composed of plagiotriaenes with overlapping cladi. Ectosomal skeleton comprises a thick discernible layer (>1000 µm) with radiating plagiotriaene tracts that pierce the surface, through a dense (up to ~100 µm thick) layer of sanidasters.

Spiculation. **Megascleres**. Oxeas, smooth, straight to slightly bent, in two size classes: I) 1748.4 (1276.7 – 2017.8) x 30.3 (16.9 – 36.8) µm, n = 10; II) 975.5 (727.5 – 1133.7) x 9.1 (6.3 – 12.5) µm, n = 10. Plagiotriaenes with short, stout cladi, rhabdome straight to slightly bent, in three size classes: I) rhabdome 1759.8 (1550.3 – 2074.9) x 38.5 (33.4 – 46.5) µm, cladome 152.3 (130.3 – 175.0) µm, cladi 89.9 (75.1 – 116.9) µm, n = 10; II) rhabdome 976.3 (924.1 – 1037.1) x 19.9 (16.6 – 23.8) µm, cladome 65.5 (51.5 – 84.4) µm, cladi 29.8 (18.8 – 38.2) µm, n = 10; III) rhabdome 608.2 (457.8 – 766.9) x 10.8 (6.1 – 18.4) µm, cladome 31.8 (19.6 – 53.4) µm, cladi 13.9 (8.4 – 24.0) µm, n = 10. **Microscleres**. Oxyasters with ~10 rays, smooth or with hooked spines: 10.9 (8.5 – 14.6) µm, n = 10. Acanthoxyasters with 4 rays and hooked spines: 18.2 (15.7 – 22.1) µm, n = 10. Acanthoxyasters, reduced tetracts with hooked spines, variable in form and spinosity: 19.2 (14.6 – 23.5) µm, n = 10. Sanidasters, acanthose, irregularly spined: 5.9 (5.2 – 6.8) µm, n = 10.

Substratum, Depth range and Ecology. Two specimens found in one sled on rocky substrate in association with tube worms and algae. Depth range: 28 – 34 m.

Geographic Distribution. Walters Shoal Seamount.

Remarks. The present material conforms to *Ancorina* Schmidt, 1862 as diagnosed by a conspicuous ectosome, the presence of oxeas and triaenes as megascleres and microscleres comprising sanidasters and euasters (Uriz 2002). Two species are present in the region of interest (Table 3): *Ancorina corticata* Lévi, 1964 and *Ancorina nanosclera* Lévi, 1967. The present material is not conspecific with the latter species due to the presence of anatriaenes in the material described by Lévi (1967) and seems more similar to *A. corticata* (Oxeas: 2000 – 2400 x 50 µm; Plagiotriaenes: rhabdome 1400 x 70 µm, cladi 130 – 150 x 50 µm; Oxyasters: 15 – 20 µm; Sanidasters: 6 µm), which lacks anatriaenes.

However, the present material differs by having two size classes of oxeas, three size classes of plagiotriaenes and reduced tetract acanthoxyasters. *Ancorina corticata* was also re-described by Samaai & Gibbons (2005), with scanning electron microscope images of the sanidasters provided, which look vastly different to the sanidasters found here. Thus, the present material likely constitutes a new species.

Genus *Chelotropella* Lendenfeld, 1907

***Chelotropella* sp. • (Fig. 18 A – L)**

Material examined. TS 2310 (WSL-INV50(1)): Walters Shoal Seamount, Grid WSL022, Station ALG10954, collected via sled (no 2) by the RV *Algoa* (33°10.9' S; 43°48.6' E) - (33°11.2' S; 43°50.2' E), duration 41 min, depth 170 – 72 m, 29 May 2014.

Description. Spherical form. Length 1.9 cm, diameter 1.5 cm and thickness 1.7 cm. Surface microhispid and prickly to the touch. One oscule (~3 mm) present at the top of the specimen. Thin ectosome (~1 mm) present, separable from the choanosome. Texture firm and dense, not compressible. Colour *in situ* dull dark brown externally, paler brown internally. In preservative, colour light brown. Slightly sticky exudate.

Skeleton. Choanosomal skeleton comprises thick, radial tracts of oxeas and triaenes (~200 – 400 µm across), forming two subdermal layers in the peripheral region. Calthrops arranged in a somewhat disorganized fashion, occasionally congregating in horizontal formations, parallel to sponge surface. Subectosomal skeleton comprises large subdermal cavities, triaenes orientated radially, with cladomes forming two layers parallel to the surface. Strongyloacanthasters concentrated in the ectosome (~300 – 500 µm), and scattered throughout the peripheral region, including around subdermal spaces.

Spiculation. Megascleres. Oxeas, smooth, straight to slightly curved, distally fusiform: 2148.9 (1097.4 – 3015.5) x 20.3 (10.9 – 30.9) µm, n = 10. Dichotriaenes, rare, in two size classes: I) often broken, rhabdome 2812.1 (2615.1 – 3077.6) x 51.1 (49.1 – 52.4) µm, cladome 501.3 (360.5 – 573.0) µm, stout protoclads 135.4 (110.8 – 153.5) µm, long deuteroclads terminating in somewhat blunt points 169.4 (89.3 – 221.8) µm, n = 3; II) rhabdome 1142.7 (786.5 – 1501.2) x 28.6 (23.6 – 33.7) µm, cladome 288.4 (253.9 – 333.9) µm, stout protoclads 117.6 (103.2 – 134.9) µm, short deuteroclads terminating in somewhat sharp points 38.8 (20.9 – 49.6) µm, n = 7. Anatriaenes: 1146.7 (806.5 – 1437.5) x 9.4 (8.1 – 11.1) µm, with cladome 71.8 (53.5 – 84.6) µm, n = 10. Plagiotriaenes, short-shafted, rare: 302.2 (111.0 – 694.4) x 15.5 (9.7 – 21.8) µm, with cladome 145.4 (62.9 – 259.9) µm, and cladi 77.2 (34.9 – 136.2) µm, n = 8. Calthrops, regular in shape, found in two size classes (ray): I) 474.1 (403.9 – 595.3) x 52.1 (43.3 – 60.7) µm, n = 10; II) 190.4 (134.0 – 259.3) x 24.4 (14.9 – 33 .8) µm, n = 10. **Microscleres**. Strongyloacanthasters with ~10 terminally hook-spined rays: 18.8 (14.1 – 23.1) µm, n = 10.

Substratum, Depth range and Ecology. One specimen found in a single sled on rocky substrate, which was host to many bivalves and sponges. Depth range: 72 – 170 m.

Geographic Distribution. Walters Shoal Seamount.

Remarks. The present material conforms to *Chelotropella* Lendenfeld, 1907 as diagnosed by the presence of calthrops, oxeas and peripheral dichotriaenes which form a radial skeleton and two subdermal layers in the peripheral region (van Soest & Hooper 2002). Erected by Lendenfeld in 1907 for a single species, this genus comprises two described species to date: *Chelotropella sphaerica* Lendenfeld, 1907 and *Chelotropella neocaledonica* Lévi & Lévi, 1983, of which only the former occurs in the region of interest, with the latter found in New Caledonia.

Although similar to *C. sphaerica* with regards to morphology (spherical sponge of ~1.8 cm with granular surface as described by Lendenfeld in 1907), the spicular component of the present material differs. The material in this study has megascleres that are smaller and narrower than those described by Lendenfeld (1907) (Oxeas: 3600 – 5600 x 50 – 80 µm; Dichotriaenes: rhabdome 2800 – 4400 x 100 – 440 µm, cladome 650 – 1300 µm, clades 130 – 170 µm; Calthrops: I) 700 – 1050 x 85 – 120 µm, II) 170 – 700 x 20 – 85 µm), with his species also lacking anatriaenes and plagiotriaenes (although intermediate forms between calthrops and triaenes are noted), but including the presence of various euaster morphologies.

Pulitzer-Finali (1993) record this species from Kenya, also with various euaster morphologies, but with megasclere size ranges more in accordance with the present material (Oxeas: 3500 – 4500 x 27 – 45 µm; Dichotriaenes: rhabdome 2400 x 80 µm, cladome 1600 µm, protoclads 270 µm, deuteroclads 500 µm; Calthrops: 300 – 760 µm). These authors also found long anatriaenes (rhabdome 4000 x 20 – 36 µm, cladome 150 – 170 µm), which led van Soest & Hooper (2002) to suggest that their material may be a new species distinct from *C. sphaerica*.

Thus, due to the presence of anatriaenes (in a much smaller size range than recorded by Pulitzer-Finali in 1993) and plagiotriaenes, as well as the lack of diverse euaster morphologies (only one type found), the present material likely constitute a new species.

Family Geodiidae Gray, 1867

Subfamily Erylinae Sollas, 1888

Genus *Penares* Gray, 1867

***Penares intermedia* (Dendy, 1905) (Fig. 19 A – J, Table 16)**

Synonymy

Plakinastrella intermedia Dendy, 1905: p. 67, Pl. I, Fig. 4, Pl. II, Fig. 2.

Material examined. TS 2300 (WSL-INV58), TS 2307 (WSL-INV57(2)), TS 2314 (WSL-INV51): Walters Shoal Seamount, Grid WSL022, Station ALG10954, collected via sled (no 2) by the RV *Algoa* (Voyage 208), (33°10.9' S; 43°48.6' E) - (33°11.2' S; 43°50.2' E), duration 41 min, depth 170 – 72 m, 29 May 2014. TS 2445 (WSL-INV74(11)), TS 2446 (WSL-INV74(12)), TS 2447 (WSL-INV74(13)), TS 2451 (WSL-INV74(17)), TS 2454 (WSL-INV74(20)), TS 2548 (WSL-INV74(30)), TS 2555 (WSL-INV74(37)): Walters Shoal

Seamount, Grid WSL024, Station ALG10956, collected via sled (no 3) by the RV *Algoa* (Voyage 208), (33°08.8' S; 43°49.1' E) - (33°09.0' S; 43°50.5' E), duration 33 min, depth 348 – 103 m, 29 May 2014.

Description. Thickly encrusting form. Length 1.5 cm, diameter 1.7 cm and thickness 0.3 cm. Surface undulating but smooth with oscules (<1 mm) scattered randomly over the surface. Thin ectosome (<1 mm) present, separable from the choanosome. Texture firm, tough, dense and leathery. Specimen not compressible, easily torn. Colour *in situ* dull orange-brown externally and internally, pale olive green in preservative.

Skeleton. Confused choanosomal skeleton, comprising of oxeas and microxeas arranged in a disorderly fashion (spicules distributed randomly), showing little tendency to form tracts. Larger oxeas sometimes aggregating in loose (somewhat radial) slanting bundles (~60 – 140 µm across). Dichotriaenes form subdermal skeleton, with cladome at surface and rhabdome inwards. Oxyasters abundant and scattered throughout. Ectosomal skeleton comprised of small oxeas, lying tangentially over dichotriaene clads, forming dense dermal crust ~200 – 300 µm thick.

Spiculation. **Megascleres**. Oxeas, slightly curved, in three size classes: I) 840.4 (703.0 – 999.1) x 27.4 (21.8 – 36.8) µm, n = 10; II) 408.6 (318.2 – 505.7) x 18.7 (14.9 – 21.9) µm, n = 10; III) 140.7 (117.9 – 164.3) x 9.8 (7.1 – 12.3) µm, n = 10. Dichotriaenes, with short rhabdomes, in two size classes: I) rhabdome not seen (~half the size of the cladome), cladome 487.1 (380.8 – 578.8) µm, stout protoclads 90.6 (68.4 – 113.3) x 37.8 (27.5 – 48.6) µm, deuteroclads terminating in somewhat blunt points, often irregular at tips 145.3 (115.9 – 178.2) x 30.2 (20.1 – 38.7) µm, n = 10; II) rhabdome not seen (~half the size of the cladome), cladome 325.1 (226.3 – 478.4) µm, thin protoclads 89.0 (74.5 – 102.8) x 21.0 (14.2 – 26.9) µm, deuteroclads terminating in sharp points 69.0 (28.3 – 122.8) x 15.1 (7.2 – 18.5) µm, n = 10. **Microscleres**. Microxeas, curved: 75.1 (62.6 – 92.1) x 6.0 (5.2 – 7.0) µm, n = 10. Acanthoxyasters with ~16 slender rays, hooked spines and sharply pointed tips: 9.3 (7.7 – 12.3) µm, n = 10.

Substratum, Depth range and Ecology. Ten specimens found on rocky substrata in two sleds, one consisting of predominantly bivalves and sponges, the other of biogenic debris and hydrozoans. Depth range: 72 – 348 m.

Geographic Distribution. Sri Lanka (Holotype), Zanzibar, North Kenya Banks, Walters Shoal Seamount.

Remarks. The present material conforms to *Penares intermedia* (Dendy, 1905) originally described as *Plakinastrella intermedia* (Oxeas: I) 1200 x 37 µm, II) 180 x 10 µm; Dichotriaenes: rhabdome 370 x 55 µm, with protoclads 92 x 55 µm; Oxyasters: 25 µm) and further records of this species by Pulitzer-Finali (1993) (Oxeas: I) 1000 – 1500 x 33 – 62 µm, II) Oxeas: 75 – 410 x 5.5 – 22 µm; Dichotriaenes: rhabdome 190 µm, protoclads 95 µm, deuteroclads 160 µm; Oxyasters: 12 – 23 µm) and Thomas (1984) (Oxeas: I) 790 x 30 µm, II) 190 x 6 – 12 µm; Dichotriaenes: protoclads 80 x 50 µm, deuteroclads 280 x 5 µm; Oxyasters: 18 µm).

Although Dendy (1905) only described one size class of dichotriaenes for *P. intermedia*, he does make note of 'slenderer' forms which he suggests are not fully developed. In addition, while providing two size classes of oxeas, he notes a large size range. The present material definitely has spined oxyasters, but the spines are only visible through the use of a scanning electron microscope, which explains the (slightly larger) ‘smooth’ oxyasters given in the original description. When viewed under a light microscope, the oxyasters of the present material also appear smooth. Thomas (1984) noted minutely spined oxyasters in his material.

Burton (1959) suggested that a similar species described by Dendy (1905), *Plakinastrella* (now *Penares*) *schulzei* (Dendy, 1905), is conspecific with *P. intermedia*, based on both the similarities in the figures drawn and a re-examination of the types. This suggestion was followed by Thomas (1984), but neglected by Pulitzer-Finali (1993). To date, *P. intermedia* and *P. schulzei* remain separate on the World Porifera Database (May 2015, van Soest *et al.* 2015) and are thus considered distinct here.

3.3 Location and depth affiliations

Location

Fifty-five and 39 sponge species were collected from the western and eastern flank of Walters Shoal Seamount respectively. Twenty-one new species were found on the western flank, with 11 of these restricted to this location, while 15 new species were found on the eastern flank, with five of these restricted to this location (Table 17).

There was no clear pattern in the distribution of sponge assemblages on Walters Shoal Seamount with regards to location (western vs. eastern flank; ANOSIM, $R = -0.296$, $p = 0.839$), with this finding illustrated in Fig. 20. Although SIMPER results indicate an average dissimilarity of ~68% between the western and eastern side of the seamount (Table 18), Table 17 documents several species that are shared by both sides (e.g. *Halichondria (Halichondria)* sp. and *Eurypon* sp. 1).

This finding is further supported in that sampling locations on the western side of the seamount had an average low sponge faunal similarity of ~35% (SIMPER), with the species contributing to 90% of this similarity consisting of *Callyspongia (Callyspongia)* sp. (26.25%), *Halichondria (Halichondria)* sp. (26.25%), *Stelletta purpurea* Ridley, 1884 (26.25%) and *Tethya* sp. (11.41%). On the eastern side of Walters Shoal Seamount, sampling locations had an overall lower sponge faunal similarity of ~19% (SIMPER), with the species contributing to 90% of this similarity consisting of *Clathria (Clathria)* sp. (29.55%), *Halichondria (Halichondria)* sp. (29.55%), *Rhabderemia* sp. (20.45%) and *Protosuberites* sp. 3 (20.45%).

Depth

The shallow and mesophotic depth zones of Walters Shoal Seamount had a similar number of species present (27 and 28 respectively), with the submesophotic depth zone having the most number of species present at 40. Species that are likely new were found predominantly in the submesophotic depth zone (17), followed by the shallow depth zone (eight) and finally the mesophotic depth zone (six). Fifteen new species were found exclusively in the submesophotic depth zone, followed by five in the shallow depth zone, and only one in the mesophotic depth zone (Table 19).

There was a clear pattern in the depth distribution of sponge assemblages on Walters Shoal (shallow, mesophotic, submesophotic; ANOSIM, $R = 0.609$, $p = 0.018$), with this finding illustrated in Fig. 21. Each depth zone had a distinct sponge assemblage, with the species contributing to 90% (100% in the submesophotic zone) of sampling location similarity in each depth zone provided in Table 20. The percent contribution of families and genera per depth zone are given in Table 21, indicating that the family Ancorinidae was well represented throughout, with Axinellidae the predominant family in the submesophotic zone. The genus *Stelletta* was well represented in all depth zones, *Callyspongia* in both the shallow and mesophotic zones and finally *Phakellia* and *Protosuberites* in the deepest zone.

The mesophotic zone acts as a transition between the shallow and submesophotic zones, sharing eight and nine species with these zones respectively. The sponge fauna inhabiting the shallow and submesophotic zones of the seamount were the most dissimilar, with only five shared families (Table 22), three shared genera (Table 23) and three shared species throughout, including *Callyspongia (Toxochalina)* cf. *robusta* (Ridley, 1884), *Stelletta purpurea* Ridley, 1884 and M1. Further SIMPER results quantifying the percentage difference between depth zones, and the species contributing to at least 60% of this difference, are provided in Table 24.

3.4 Biogeographical affiliations

According to the 23 known sponge species recorded from Walters Shoal in this study, the seamount demonstrates a relatively low similarity to surrounding regions. The highest affinities were with the Western Indo-Pacific (21.8% shared species) and Temperate Southern African (10.3% shared species) realms. No affiliations were found with Vema Seamount, the Temperate South American or Southern Ocean realms. At the province level, Walters Shoal Seamount demonstrates the most affiliation with the Western Indian Ocean (21.8% shared species), Agulhas (9.0% shared species) and Benguela (5.1% shared species) provinces.

Within these provinces, the sponge fauna was most similar to that found in the East African Coral Coast Ecoregion (12.8% shared species), followed by the Seychelles as well as the Western and Northern Madagascar (both 10.3% shared species) ecoregions. Affiliations with the remaining ecoregions in the Western Indian Ocean (excluding Southeast Madagascar) and Temperate Southern African (excluding Amsterdam-St Paul) provinces were approximately 1 – 5% shared species (see Table 25).

At higher taxonomic levels (including all OTU's) the sponge fauna of Walters Shoal was comprised predominantly of species in the Ancorinidae (12.7%), Halichondriidae (10.9%), Axinellidae (9.1%) and Suberitidae (9.1%) families. This was consistent with the surrounding regions, with more than half of the ecoregions having a large representation of the family Ancorinidae (see Table 26). The Northern Monsoon Current Coast, Seychelles, Delagoa and Natal ecoregions have a fauna dominated by this family. Alternatively, Halichondriidae was only relatively well represented in the East African Coral Coast and Seychelles ecoregions, Axinellidae in the East African Coral Coast, Cargados Carajos/Tromelin Island and Delagoa ecoregions and Suberitidae only at Walters Shoal Seamount. *Stelletta*, *Phakellia* and *Protosuberites* were the most represented genera at Walters Shoal at 7.8%, 5.9% and 5.9% respectively. *Phakellia* and *Protosuberites* were not well represented in the other ecoregions, while *Stelletta* was relatively well represented in the Mascarene Islands, Delagoa and Natal ecoregions.

Thirty-nine percent of the known sponge species found at Walters Shoal Seamount are widely distributed in the Indian Ocean (Fig. 22). Of these, five species – *Callyspongia (Toxochalina) robusta* (Ridley, 1884), *Chondrosia debilis* Thiele, 1900, *Discodermia panoplia* Sollas, 1888, *Stelletta purpurea* Ridley, 1884 and *Zyzzya fuliginosa* (Carter, 1879) – have distributions that also extend into the Pacific Ocean. A similar number of species (35%) are found exclusively within the Western Indian Ocean region, with this study representing the southernmost distribution record for several of these (e.g. *Amorphinopsis fistulosa* (Vacelet, Vasseur & Lévi, 1976) and *Axinyssa aplysinoides* (Dendy, 1922)). Twenty-six percent of the known species recorded from this study have a restricted distribution around South Africa.

This thesis constitutes the only study dedicated exclusively to the diversity, distribution and biogeographical affiliations of the sponge fauna of Walters Shoal Seamount and augments the current knowledge of sponges in the very data-sparse Western Indian Ocean region, including the little-known seamount habitat.

4.1 Diversity

A total of 255 sponge specimens were collected from Walters Shoal Seamount, comprising 78 operational taxonomic units (OTU's) or putative species. Twenty-three of these are known, 26 likely constitute species new to science and potential endemics, 16 could only be identified to higher taxonomic levels and 13 could only be designated as morphospecies due to a lack of diagnostic material. A large proportion (~80%) of the OTU's were assigned to the class Demospongiae, which includes about 80% of all described sponge species worldwide (Hooper & van Soest 2002, van Soest *et al*. 2012).

This study represents one of the highest records of sponge faunal diversity from seamount studies thus far, with other works recording less than 40 species (Lévi 1969, Schlacher-Hoenlinger *et al*. 2005, Xavier & van Soest 2007). This could possibly be attributed to limited sampling in previous studies (as noted by Schlacher-Hoenlinger *et al*. 2005 and Xavier & van Soest 2007), as well as the inclusion of deeper specimens in the current study. It could also reflect biogeographical affinities of Walters Shoal with the highly diverse Western Indo-Pacific Realm (Roberts *et al*. 2002) and/or global patterns of sponge diversity, with higher numbers in the tropics (van Soest *et al*. 2012).Walters Shoal is also somewhat isolated (Groeneveld *et al*. 2006, Gopal 2007), possibly leading to diversification (Kadmon & Allouche 2007). In addition, the region is subject to a wide range of biogeographic and/or oceanographic features, as suggested by Laptikhovsky *et al*. (2015) to explain the high diversity of cephalopod fauna from both the Southwest Indian Ocean and Madagascar Ridge (sampled just northwest of Walters Shoal). Finally, the coralligenous-like substrate may generate small-scale spatial complexity and allow for the formation of heterogeneous microhabitats (Bertolino *et al*. 2013). This in turn might enable diversification, especially with regards to small cryptic species, with many of the sponges documented from Walters Shoal Seamount, especially in the deeper regions, being morphologically similar to those recorded for Mediterranean coralligenous accretions by Bertolino *et al*. (2013).

In contrast, Collette & Parin (1991) recorded a relatively depauperate shallow-water fish community of 20 species from the seamount, similar to a temperate rocky fish community, although with less diversity. This is possibly due to the absence of (larger scale) structural complexity, as well as limited food resources, with the maximum accumulation of vertically migrating zooplankton occurring just below the photic zone, and the supply declining over very shallow structures that occur within this layer (Genin 2004, Genin & Dower 2007). The discrepancy between seamount ichthyofauna and benthic communities has been recorded previously, with mobile plankton and pelagic fish species often similar to (or the same as) those from nearby oceanic pelagic communities, while sessile invertebrates often differ more from the surrounding seafloor and/or continental margins (Stocks & Hart 2007, Shank 2010).

New species

Previous studies on Walters Shoal Seamount have led to the discovery of several new and endemic invertebrate (Kensley 1969, Clark 1972, Kensley 1975, Kensley 1981, Groeneveld *et al*. 2006) and fish species (Poss & Collette 1990, Collette *et al*. 1991, Iwamoto *et al*. 2004). This study found a relatively high number (~33.3%) of putative new sponge species probably attributed to the undersampled and underworked state of this group from the Western Indian Ocean region (Kelly-Borges 1997, Richmond 2001), other seamounts in the Indian Ocean (Sautya *et al*. 2011) and Walters Shoal. This is further demonstrated by the fact that many of the new species include some of the most abundant (*Halichondria (Halichondria)* sp., *Rhabderemia* sp., *Tethya* sp.), accessible, and conspicuous (*Callyspongia (Callyspongia)* sp., *Clathria (Clathria)* sp.) specimens collected during this study. Moreover, this number could increase following further investigation of those specimens currently only identified to higher taxonomic levels and/or designated as morphospecies.

Interesting specimens include *Latrunculia (Biannulata)* sp., *Hymerhabdia* sp., *Chelotropella* sp. and *Thrombus* sp. The genus *Latrunculia* is found predominantly in Southern Ocean waters (Samaai & Kelly 2002) and contains biologically active compounds (e.g. Capon *et al*. 1987, Duckworth & Battershill 2001), while there are eight species of the genus *Hymerhabdia* worldwide, with the species found in this study representing the first record of this genus in the Indian Ocean (van Soest *et al*. 2015). The *Chelotropella* species represents the third species of this genus documented globally (van Soest *et al*. 2015), while there are five species documented from the monogeneric *Thrombus*, with the current material being the second species documented from the Indian Ocean (van Soest *et al*. 2015).

4.2 Location and depth affiliations

As found in other sessile benthic assemblages on seamounts (e.g. Bo *et al*. 2011, Sautya *et al*. 2011, Thresher *et al*. 2014, McClain & Lundsten 2015), the sponge fauna inhabiting these features often demonstrate significant differences with position on the seamount and depth, often according to local geomorphology and hydrodynamic conditions (Bo *et al*. 2011). Examples include studies by Henrich *et al*. (1992, Vesterisbanken Seamount), Pereira *et al*. (2015, Condor Seamount) and Xavier *et al*. (2015, Schultz Seamount).

Location

The sponge fauna of Walters Shoal Seamount demonstrated no clear patterns in distribution with regards to location (western vs. eastern flank) with several species shared by both sides. This can also be seen in other benthic invertebrates, especially in the shallow regions of the seamount, including the crinoid *Comanthus wahlbergi*. This is possibly due to the flat (see Fig. 2), generally homogenous topography of this seamount (Fig. 23), characterised by its relatively small size, shallow nature, low growth profile and the absence of structural complexity as noted by Collette & Parin (1991), in addition to local oceanographic conditions.

Both Nesis (1994) and Gopal (2007) suggest some form of isolation and larvae retainment of the waters above the seamount, which may possibly be a horizontal tidal current as recorded by Collette & Parin (1991). Previous reports of upwelling at Walters Shoal (Collette & Parin 1991) were thus not supported by the sponge distributions found in this study. However, Read & Pollard (2015) found high blocking factors for shallow seamounts within the Southwest Indian Ocean, which is conducive to Taylor cap formation, whereby water is trapped over the crest of the seamount. Thus, further sampling on the northern and southern flank of Walters Shoal is necessary to rule this process out.

Depth

The structure and composition of seamount benthic communities is often influenced by depth, according to environmental gradients (such as temperature and oxygen concentration) that are associated with this factor (Stocks & Hart 2007, Clark *et al*. 2010, Consalvey *et al*. 2010). As expected, sponge assemblages on Walters Shoal Seamount demonstrated a clear pattern with regards to depth distribution, with each depth zone (shallow: 15 – 30 m, mesophotic: 31 – 150 m, submesophotic: >150 m) harbouring a distinct sponge assemblage.

Sponge fauna similarities according to the sampling locations in each depth zone, decreased from the shallow (~35%) to the mesophotic (~21%) and submesophotic (~15%) zones, probably due to the decreasing number of sampling locations per zone (shallow: five, mesophotic: four and submesophotic: three). The increasing area and depth range possibly also plays a role, with the submesophotic zone incorporating all specimens from ~150 – 500 m, while the shallow zone only incorporates those from ~20 – 30 m. In addition, depth ranges may be species- (or higher taxonomic level) specific, with certain families and genera dominating a particular depth zone, or well represented throughout.

Species richness and the number of putative new species was highest in the submesophotic depth zone (approximately double that found in the shallow and mesophotic depth zones), with 15 putative new species found exclusively in this zone. This is inconsistent with findings by Samaai *et al*. (2010), who found sponge species richness to decline with depth, but is attributed here to the larger area and depth range incorporated in the submesophotic depth zone as discussed above. Additionally, the lack of work done on the sponge fauna of the Western Indian Ocean, especially in deeper regions (Kelly-Borges 1997, Richmond 2001) could explain the higher number of putative new species in the deepest zone.

4.3 Biogeographical affiliations

The 26 species that are likely new to science are also possibly endemic to Walters Shoal Seamount, and thus demonstrate a relatively high level (~33.3%) of endemism. This finding is consistent with other studies on seamount sponges: Lévi (1969) recorded 53%, Xavier & van Soest (2007) recorded 28% and Schlacher-Hoenlinger *et al*. (2005) noted a fauna dominated by 'spot endemics' (species restricted to a single site) from South Pacific seamounts. As sessile organisms, with larvae that have limited swimming capabilities, occasional asexual propagation and a relatively short planktonic life (Maldonado 2006, Mariani *et al*. 2006), most sponges are found in local or regional areas of endemism (van Soest *et al*. 2012), with shallow seamounts possibly constituting centres of endemism for shallow-water sponges as suggested by Xavier & van Soest (2007), and supported by Lévi's (1969) study. This high level of potential endemism could be further attributed to the somewhat isolated nature of the feature (Groeneveld *et al*. 2006, Gopal 2007) and the retentive oceanographic processes found above Walters Shoal (Nesis 1994, Gopal 2007). Then again, the degree of seamount endemicity has been called into question, with too little work done on these features and the fauna they support, to use this term with confidence (McClain 2007). Therefore, the high level of sponge fauna endemism reported here is more likely indicative of the low sampling effort in this region as mentioned previously, and within deeper ocean realms as suggested by Samadi *et al*. (2007).

Collette & Parin (1991) recorded a high level of endemism in the shallow-water fish fauna of Walters Shoal, with 30 – 40% endemic to some part of the chain of islands and seamounts within their defined West Wind Drift Islands Province (WWDIP), including Tristan da Cunha, Gough Island, Vema Seamount, Walters Shoal, UN-2 (unnamed seamount south of Madagascar) and the St Paul and Amsterdam islands (Nesis 2003). Fewer species (~two) are endemic to Walters Shoal Seamount alone. This higher level of endemism for benthic seamount invertebrates is consistent with findings from Wilson & Kaufmann (1987), Stocks & Hart (2007), Xavier & van Soest (2007) and Shank (2010), and is probably due to the generally more advanced biogeographic and taxonomic knowledge of fish as well as their mobility, which enables genetic mixing with non-seamount populations (Stocks & Hart 2007).

Based on the 23 known sponge species recorded in this study, Walters Shoal Seamount has affinities with the Western Indo-Pacific and Temperate Southern African realms and is comprised of almost equally represented provincial (Western Indian Ocean excluding South Africa; 35%) and widespread to cosmopolitan (Indian Ocean; 39%) species. These affiliations, in addition to the range extensions found for several species in this study, indicate that there is some means of larval dispersal within this region.

There is a deep oceanic trench between Walters Shoal Seamount and the African shelf (Romanov 2003, Gopal 2007), with sponge larvae probably dispersed via local oceanographic mechanisms, including currents and eddies. The circulation of the Southwest Indian Ocean is dominated by the combined eastward flow of the Agulhas Return Current (ARC) and Subtropical Front (Read & Pollard 2015). However, Walters Shoal lies in a subtropical gyre north of these flows, in a region of slow mean westward flow between the southern tip of Madagascar and the ARC and is close to the path of eddies that propagate southwest from the east of Madagascar (Pollard & Read 2015, Read & Pollard 2015). Consequently, although previously included in the WWDIP, Walters Shoal is not located within the West Wind Drift and is bathed by warmer, south-to-southwestwardly flowing waters from the subtropical branch of the South Equatorial Current (Iwamoto *et al*. 2004), demonstrated by the warm surface waters (19 – 23^{0}C) recorded by Collette & Parin in 1991.

The affiliation of Walters Shoal Seamount with the Western-Indo Pacific (especially the East African Coral Coast, Seychelles as well as the Western and Northern Madagascar ecoregions) is probably driven by the train of large anti-cyclonic eddies within the Mozambique Channel, that transport entrained larvae south (Ridderinkhof *et al*. 2001, de Ruijter *et al*. 2002). Larvae may be further entrained into the Agulhas Current, possibly explaining faunal similarities with South Africa. Additionally, sponge larvae may be entrained and transported to South Africa via eddies propagating southwest from the east of Madagascar (Pollard & Read 2015, Read & Pollard 2015). Eddies have previously been shown to act as strong retention mesoscale structures that transport larvae and connect marine populations (Landeira *et al*. 2010).

Overall, Walters Shoal sponge fauna demonstrated a relatively low similarity to surrounding regions, with no species found to be common to both the seamount and other ecoregions within the WWDIP, as found for the fish fauna. This may be due to the use of the incomplete World Porifera Database (van Soest *et al*. 2015), which is biased according to collection and taxonomy efforts (van Soest *et al*. 2012). For example, the database only records 21 sponge species for the Tristan Gough Ecoregion, 13 for Vema Seamount and eight for the Amsterdam-St Paul Ecoregion. This is further supported by the finding that within the Western Indian Ocean Province, Walters Shoal sponge faunal similarities increased according to the number of species recorded for that ecoregion (i.e. the East African Coral Coast Ecoregion had the highest sponge faunal affinities with Walters Shoal as well as the highest number of sponge species recorded at 172).

Thus, the findings of this study regarding the biogeographical affiliations and high potential endemism of the sponge fauna found on Walters Shoal Seamount should be considered with caution. Although current, and updated regularly, the World Porifera Database (van Soest *et al*. 2015), on which these findings were based, is still incomplete and lacking data, with the retrievable distribution data a minimum of what is known about current species distributions (R. van Soest, personal communication, February 13, 2015).

The use of this database does provide some insight though, with findings somewhat consistent with previous work on the fish and cephalopod fauna of this seamount. In addition, at higher taxonomic levels (including all OTU's) the sponge fauna was comprised predominantly of species in the Ancorinidae family, which was consistent with the surrounding regions that have affiliations with this seamount, with more than half of the ecoregions having a large representation of this family. Hence, although not conclusive, this study, in conjunction with the previous work done on the seamount, could act as a basis for future work, leading to a more thorough understanding of the biogeographical affiliations of this shallow seamount.

4.4 Study limitations and future work

Key limitations found during this study include the ambiguous definition of Walters Shoal in the literature, with researchers citing the seamount in some form, but providing different coordinates as well as the inaccessibility of essential papers. The latter includes Parin *et al.* (1993) and Detinova & Sagaidachny (1994), who documented distribution patterns of both the benthic and water-column fauna of Walters Shoal. As of September (2015), communications are still underway with T.N. Molodtsova of the P.P. Shirshov Institute of Oceanology to try gain access to this literature, after correspondence with various other researchers has been unsuccessful.

Samples were obtained from relatively few sites (including nine epibenthic sleds, two SCUBA dives and a lobster trap) and further sampling, especially on the northern and southern flank (which were largely neglected), could reveal an even higher diversity of sponge fauna, or further elucidate sponge assemblage location and depth distributions. Another issue faced was the relatively small size of sponge specimens obtained, which often led to difficulties in obtaining enough material for adequate identification and descriptions. In addition, the lack of work carried out on the sponge fauna of the Western Indian Ocean, and the resultant state of the largely outdated taxonomic literature, which is in need of extensive revision (Kelly-Borges 1997, Richmond 2001), often hampered the ability to identify and describe specimens confidently. As these records are the basis for the (incomplete) World Porifera Database (van Soest *et al*. 2015), bias according to collection and taxonomy efforts (van Soest *et al*. 2012) was also evident when using these data to further elucidate the biogeographical affiliations of Walters Shoal. Finally, the lack of work on seamount-inhabiting sponges made comparisons of the sponges in this study, and those documented from other seamount studies, tenuous.

Future work regarding the sponges collected from Walters Shoal Seamount in this study includes the publication of new species descriptions, with samples from most of the 255 specimens collected for genetic work, in order to confirm current identifications. In addition, larger scale genetic work needs to be conducted on both the invertebrate and fish fauna of Walters Shoal, and surrounding non-seamount populations in order to further understand the biogeography of this seamount, and the role currents and eddies possibly play in larval dispersal and connectivity. This, in conjunction with further work on the sponge fauna and oceanographic processes of the Western Indian Ocean region, may also clarify the possibility or role of this seamount in acting as a stepping stone for species along the Madagascar Ridge, or further eastwards into the central Indian Ocean. As suggested by van Soest *et al*. (2012), a regional approach in the attempt to document sponge fauna and expose distribution patterns is needed in the Western Indian Ocean region. As such, the taxonomic literature in this region is in need of extensive revision, with the aid of new technologies and accessible resources (e.g. online sponge identification website and guidebooks). This will also enable a more robust database (World Porifera Database, van Soest *et al*. 2015) for use in future work.

4.5 Conclusion

This study has substantially contributed to the knowledge of the sponge fauna from seamounts within the Indian Ocean, but more specifically, Walters Shoal Seamount. Prior to this study, Sautya *et al*. (2011) suggested that there were only reports on 'Porifera' and 'Hexactinellida' from two Indian Ocean seamounts each in the literature.

Nonetheless, this is only one element of the multidisciplinary cruise launched in May (2014) as a component of the third phase of the African Coelacanth Ecosystem Programme (ACEP III). Once additional data from the cruise has been processed, including information on the invertebrate and fish fauna, as well as the physical and chemical environment of the shoal, the findings of this study will hopefully contribute to a better understanding of the Walters Shoal Seamount ecosystem.

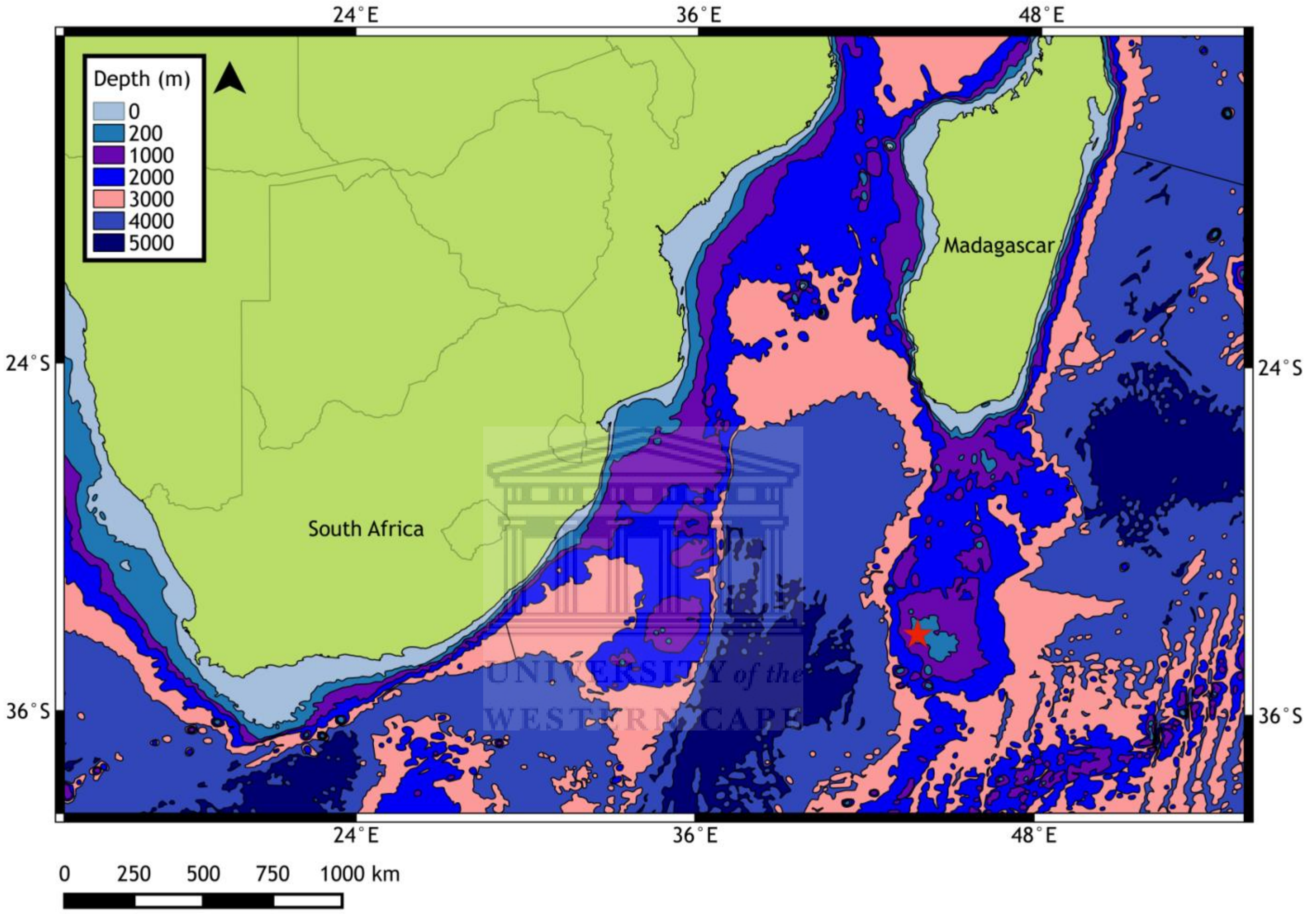


Fig. 1: Map showing the location of Walters Shoal Seamount (red star) within the bathymetric context of the Western Indian Ocean region (generated using QGIS v.2.6.1; available: qgis.osgeo.org/en/site/).

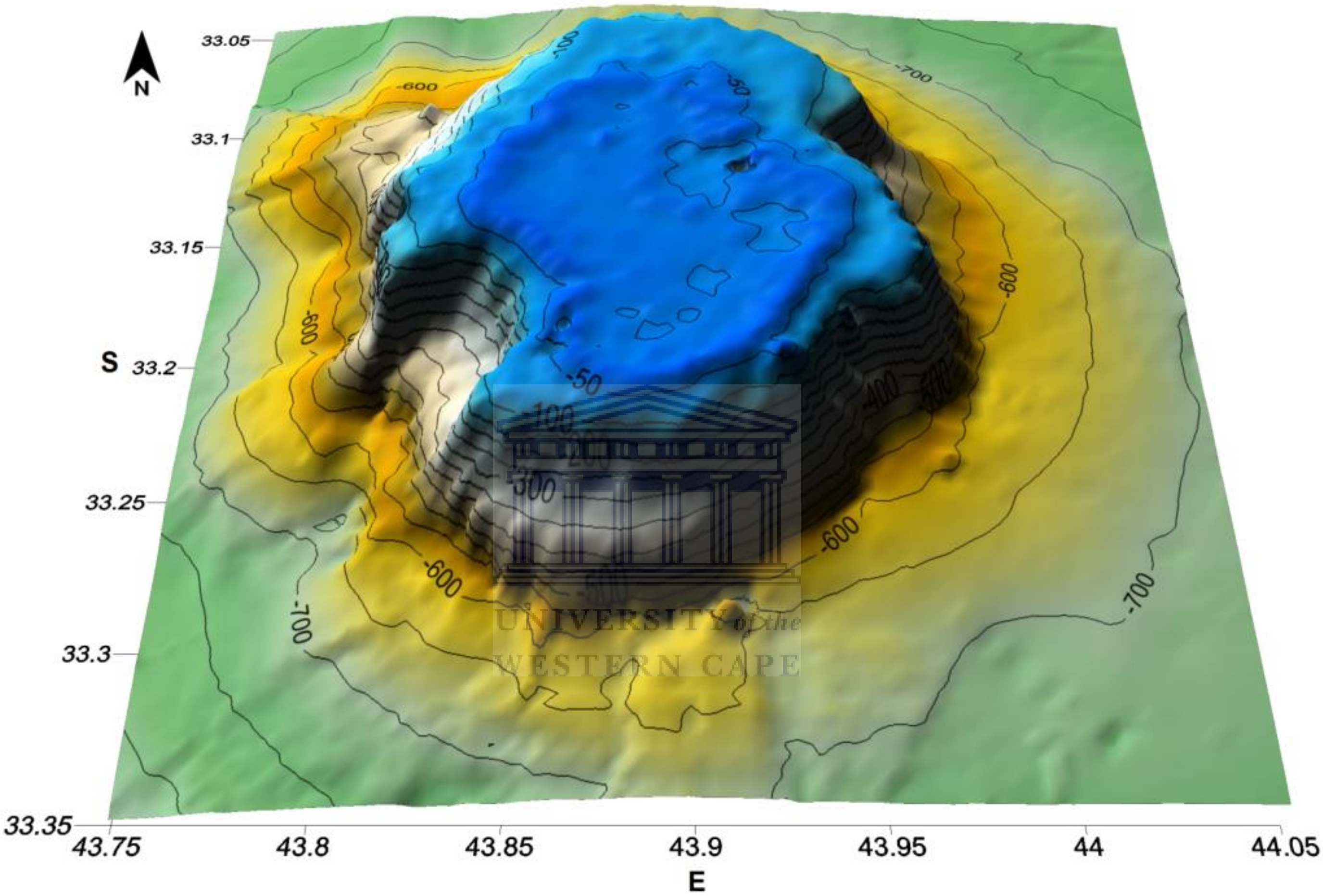


Fig. 2: Bathymetric map of Walters Shoal Seamount (generated using Surfer 9; Golden Software, available: www.goldensoftware.com).

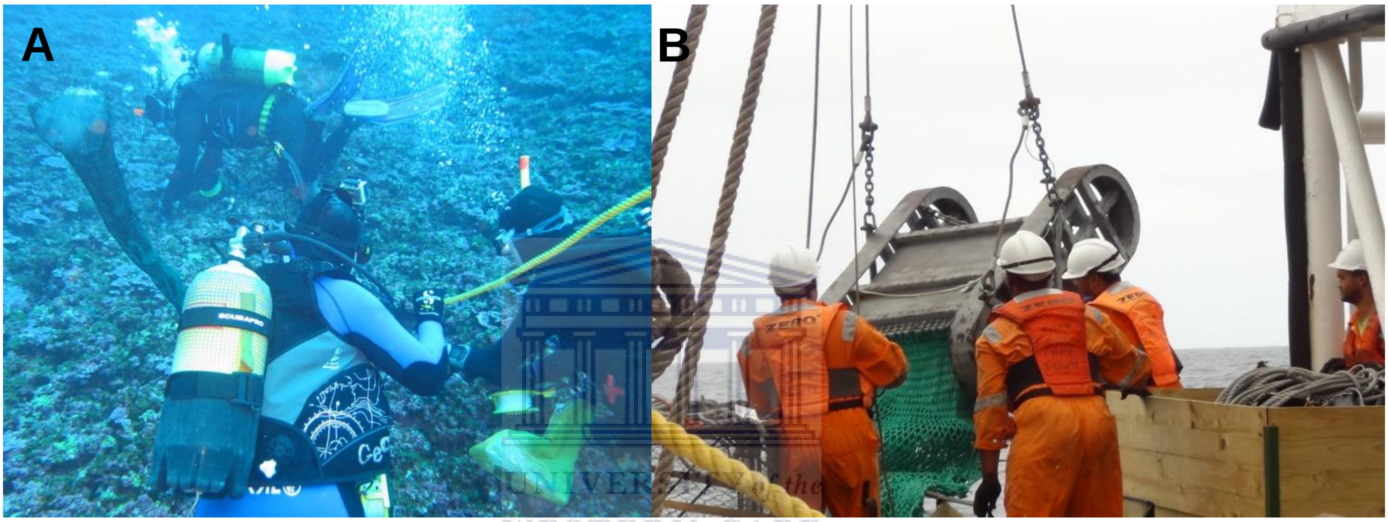


Fig. 3: Sponge specimen sampling strategies included SCUBA dives (**A**, © Toufiek Samaai) and the use of a roughed epibenthic sled, here shown being deployed by the RV *Algoa* crew (**B**, © Robyn Payne).

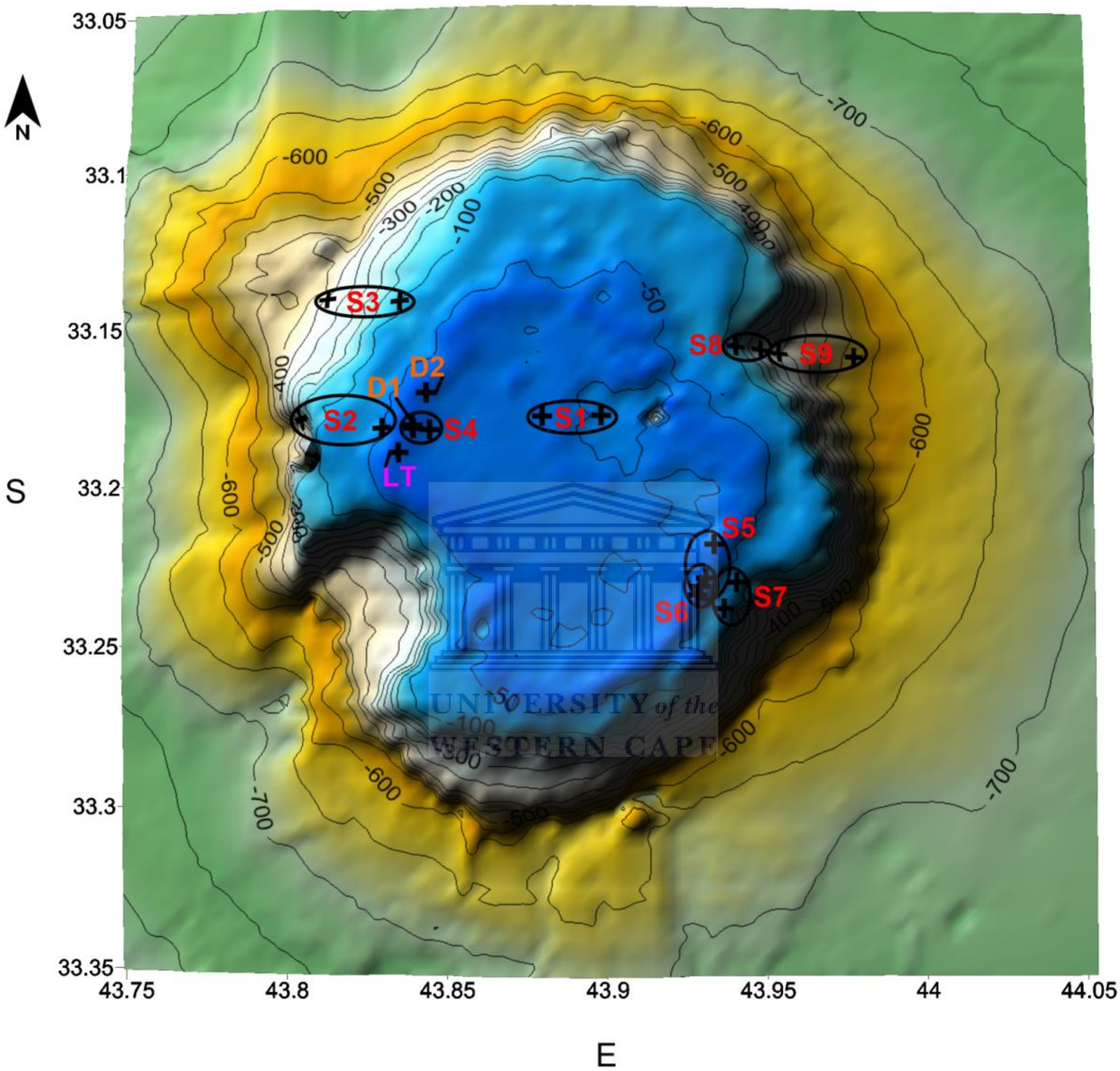


Fig. 4: Bathymetric map of Walters Shoal Seamount (generated using Surfer 9; Golden Software, available: www.goldensoftware.com), with sled (S), dive (D) and lobster trap (LT) sampling locations.

SAMPLE# ____________

ORGANISM sponge ascidian other ____________________________

INSTANT ID ____________________________

IDENTIFICATION ____________________________

DATE ____________ COLLECTOR ____________ LOCATION ____________

DEPTH ____________ HABITAT ____________ SUBSTRATE ____________

DIMENSIONS thickness ____________ length ____________ diameter ____________

FORM thinly encrusting thickly encrusting fingery projections massive fingers
frilly vase tube branching spherical bushy
colonial solitary social stalked
other: ____________________________

COLOUR exterior ____________ interior ____________ change?
pattern? ____________________________

TEXTURE/CONSISTENCY soft spongy fibrous tough rubbery cheesy firm
dense crisp brittle stony crunchy stringy sandy falls apart
other: ____________________________

COMPRESSIBLE very medium barely not

TEARS easily so so hard BREAKS easily so so hard

SPICULES? no yes FIBERS? no yes

SURFACE smooth undulating but smooth slippery bumpy pitted rough fuzzy conulose
prickly sandy

OSCULES/SIPHONS no yes size______ distribution ____________________

EPI/ENDOFAUNA? no yes describe ____________________

MUCOUS/EXUDATE? no yes sticky slimey describe ____________________

SMELL? no yes describe ____________

ABUNDANCE rare occasional common abundant

SAMPLE SIZE ____________ kg

PHOTO in situ above water

Fig. 5: Sheet completed per sponge specimen to denote macroscopical features (note: this sheet was filled in as far as possible per specimen, but often several fields were omitted).

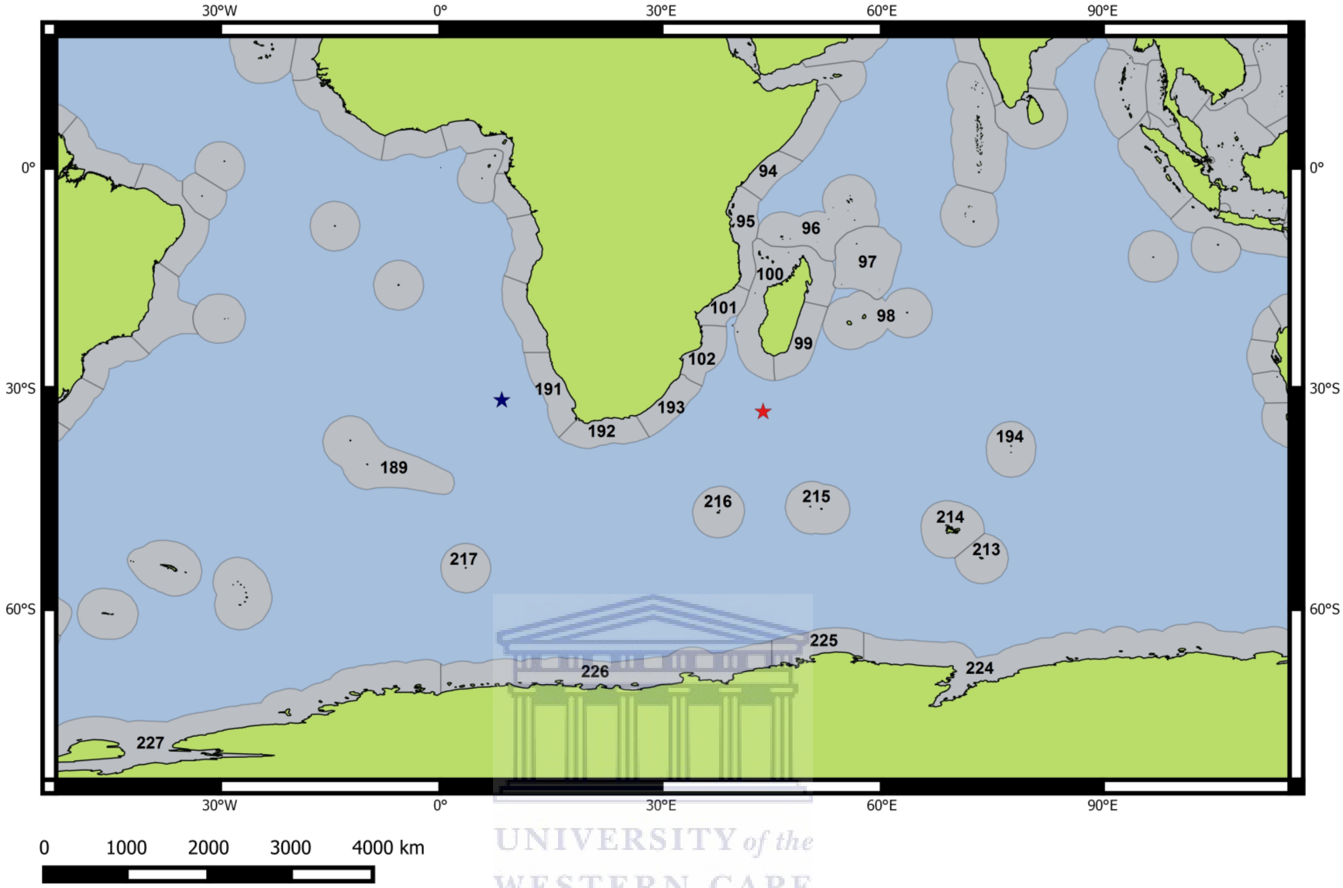


Fig. 6: Map showing the ecoregions, as defined by Spalding *et al*. (2007), surrounding Walters Shoal Seamount (red star) that were included in the biogeographical analyses. Ecoregions 101 (Bight of Sofala/Swamp Coast) and 217 (Bouvet Island) were excluded as they had one and zero sponge species recorded by the World Porifera Database (van Soest *et al*. 2015) respectively. Vema Seamount is also included for comparison (blue star), due to its associations with the West Wind Drift Islands Province. Figure generated using QGIS v.2.6.1, available: qgis.osgeo.org/en/site/.

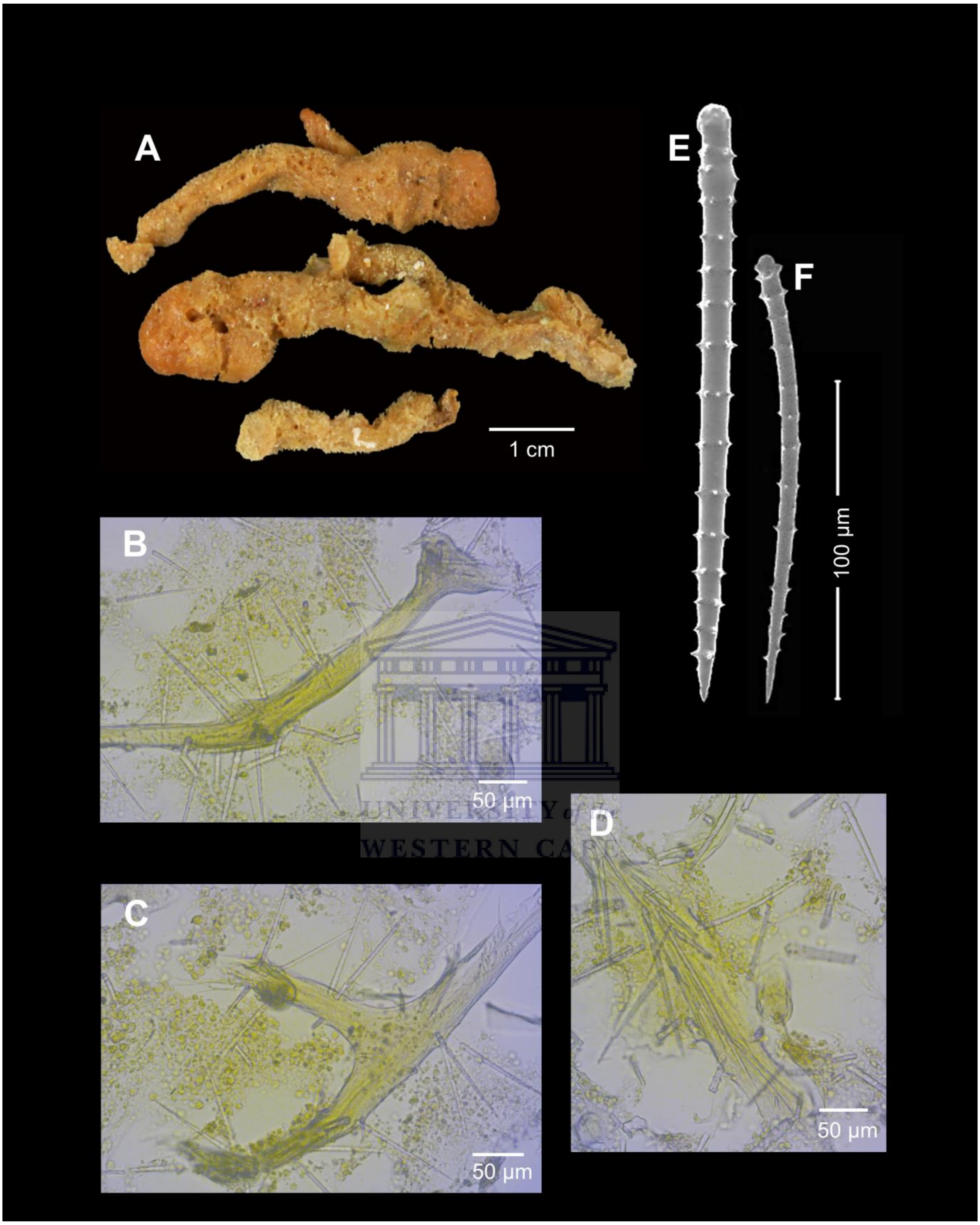


Fig. 7: A – *Agelas ceylonica* Dendy, 1905. B, C, D – Skeletal architecture. E – Verticillate acanthostyle I. F – Verticillate acanthostyle II.

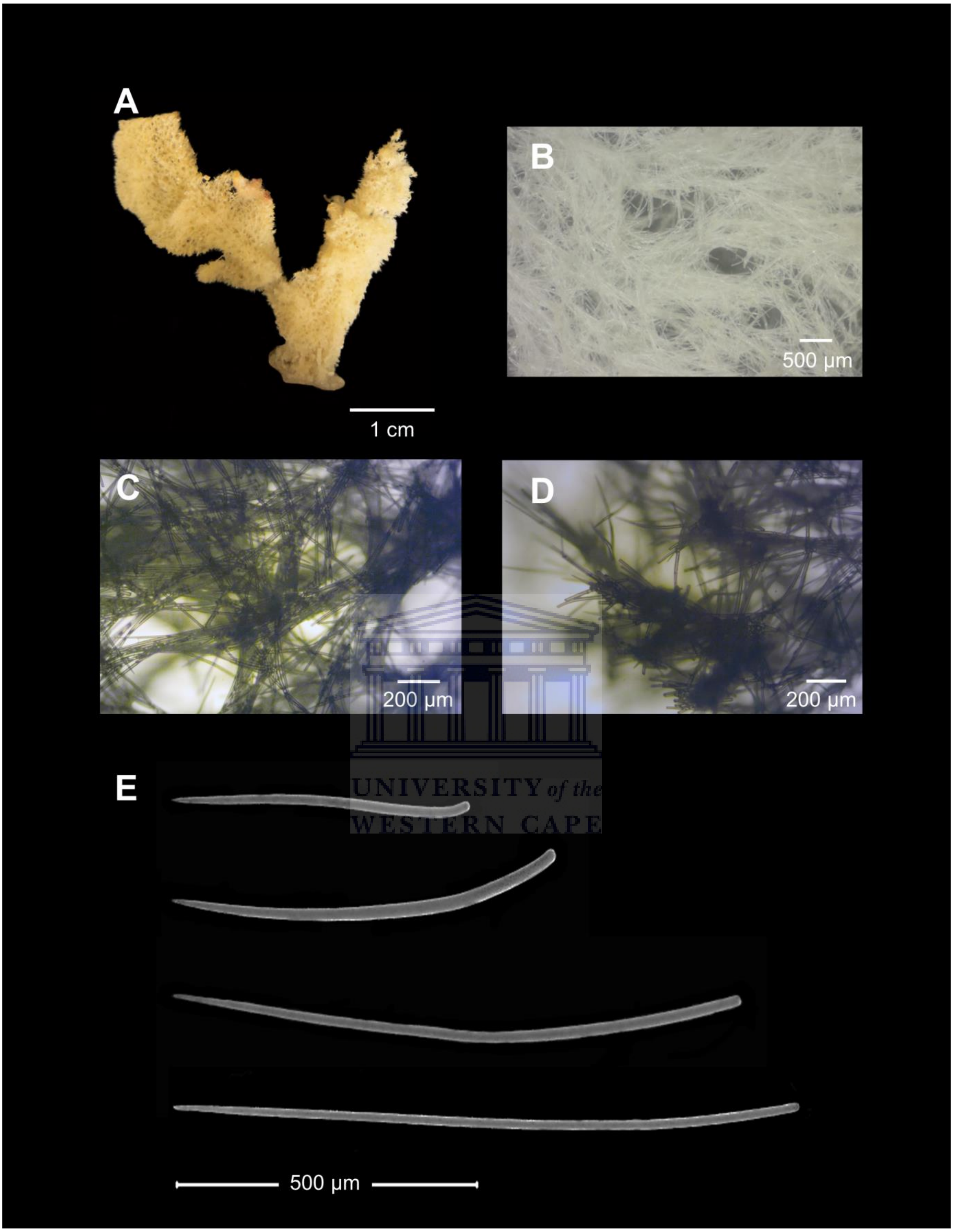


Fig. 8: A – *Ptilocaulis* sp. • B, C, D – Skeletal architecture. E – Styles.

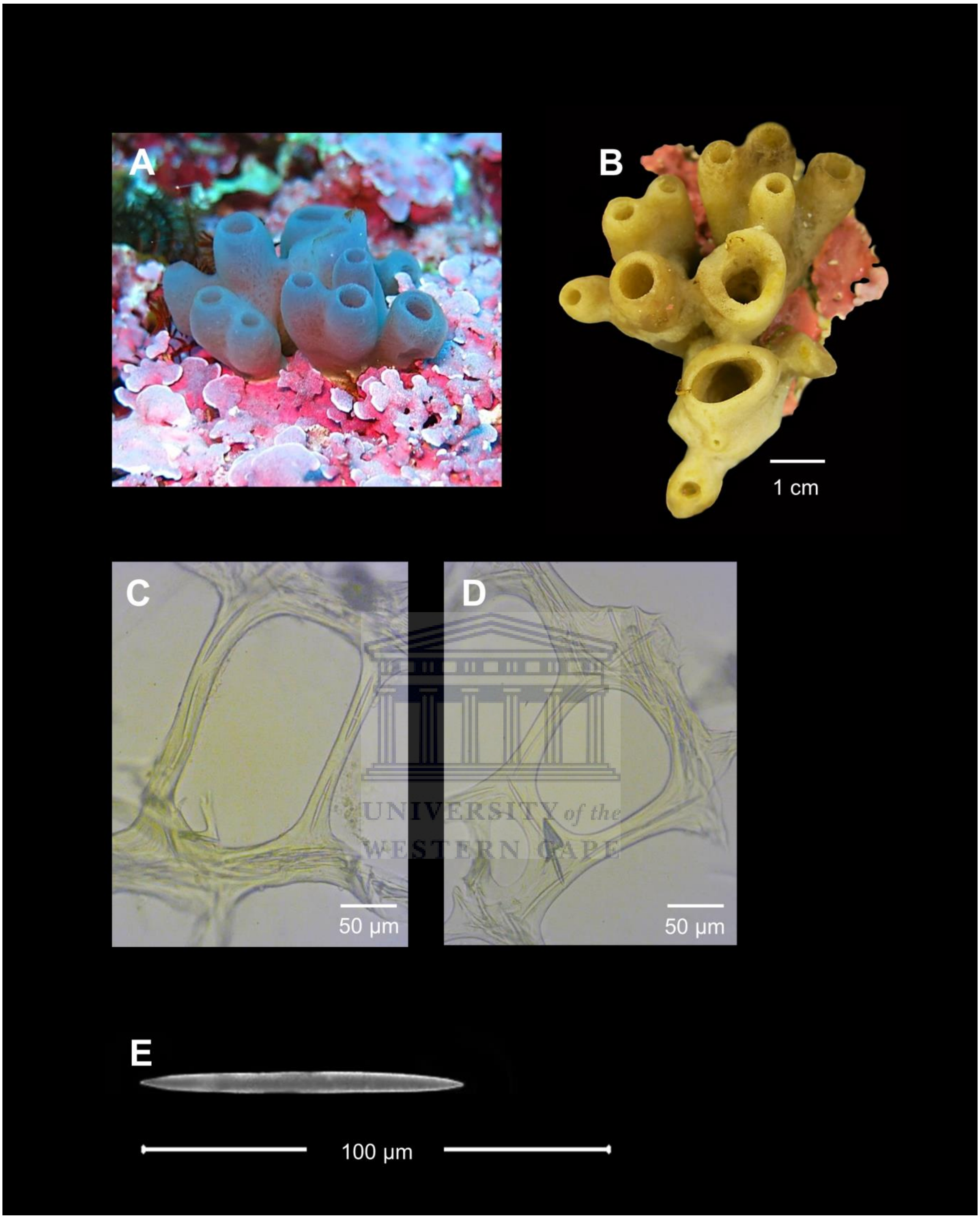


Fig. 9: A, B – *Callyspongia (Callyspongia) sp*. • (© Toufiek Samaai). C, D – Skeletal architecture. E – Oxea.

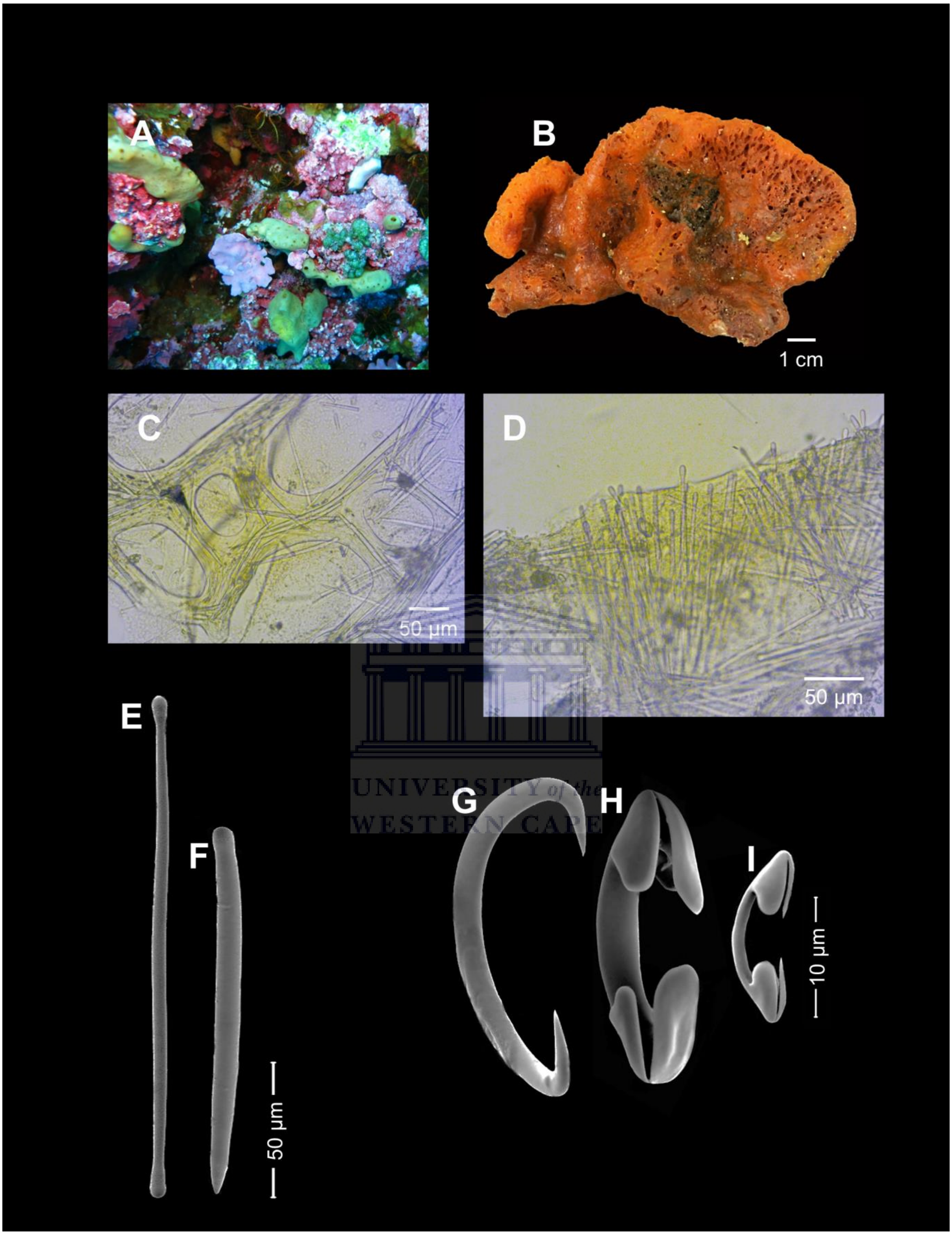


Fig. 10: A, B – *Lissodendoryx (Lissodendoryx) pygmaea* (Burton, 1931) (© Stephen Kirkman). C, D – Skeletal architecture. E – Tylote. F – Style. G – Sigma (C-shaped). H – Isochela I. I – Isochela II.

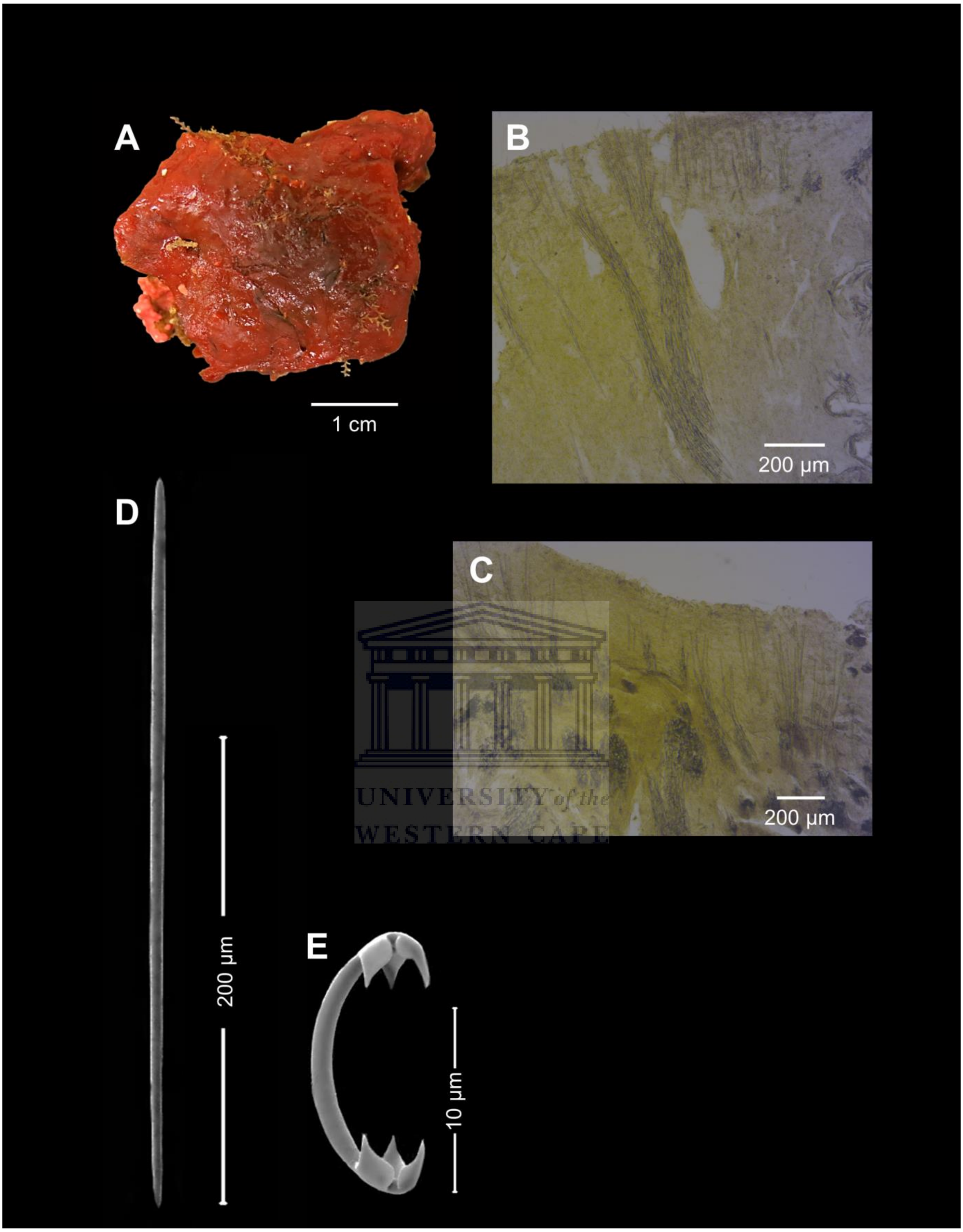


Fig. 11: A – *Fibulia ectofibrosa* (Lévi, 1963). B, C – Skeletal architecture. D – Oxea. E – Isochela.

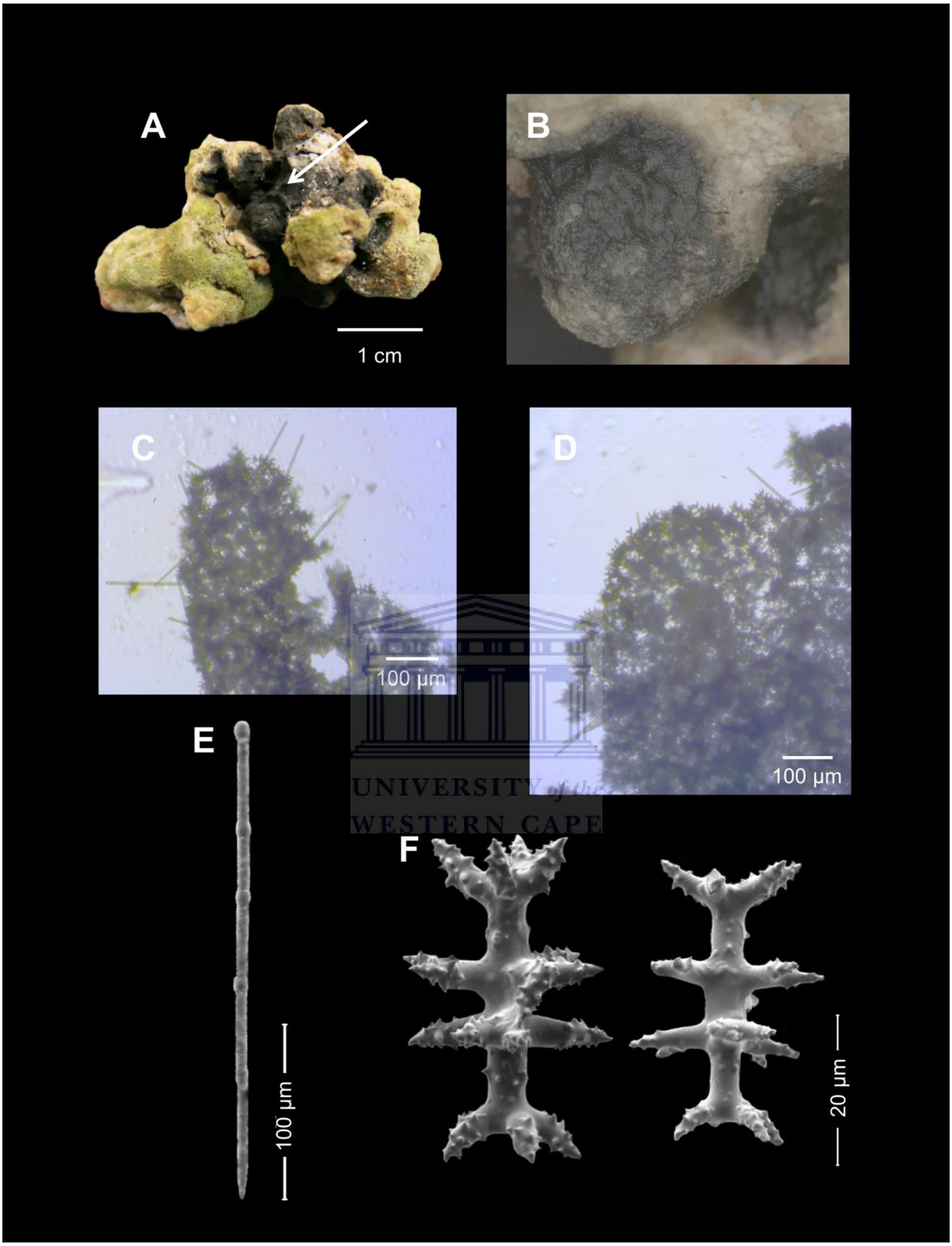


Fig. 12: A, B – *Latrunculia (Biannulata)* sp. • C, D – Skeletal architecture. E – Style. F – Anisodiscorhabds.

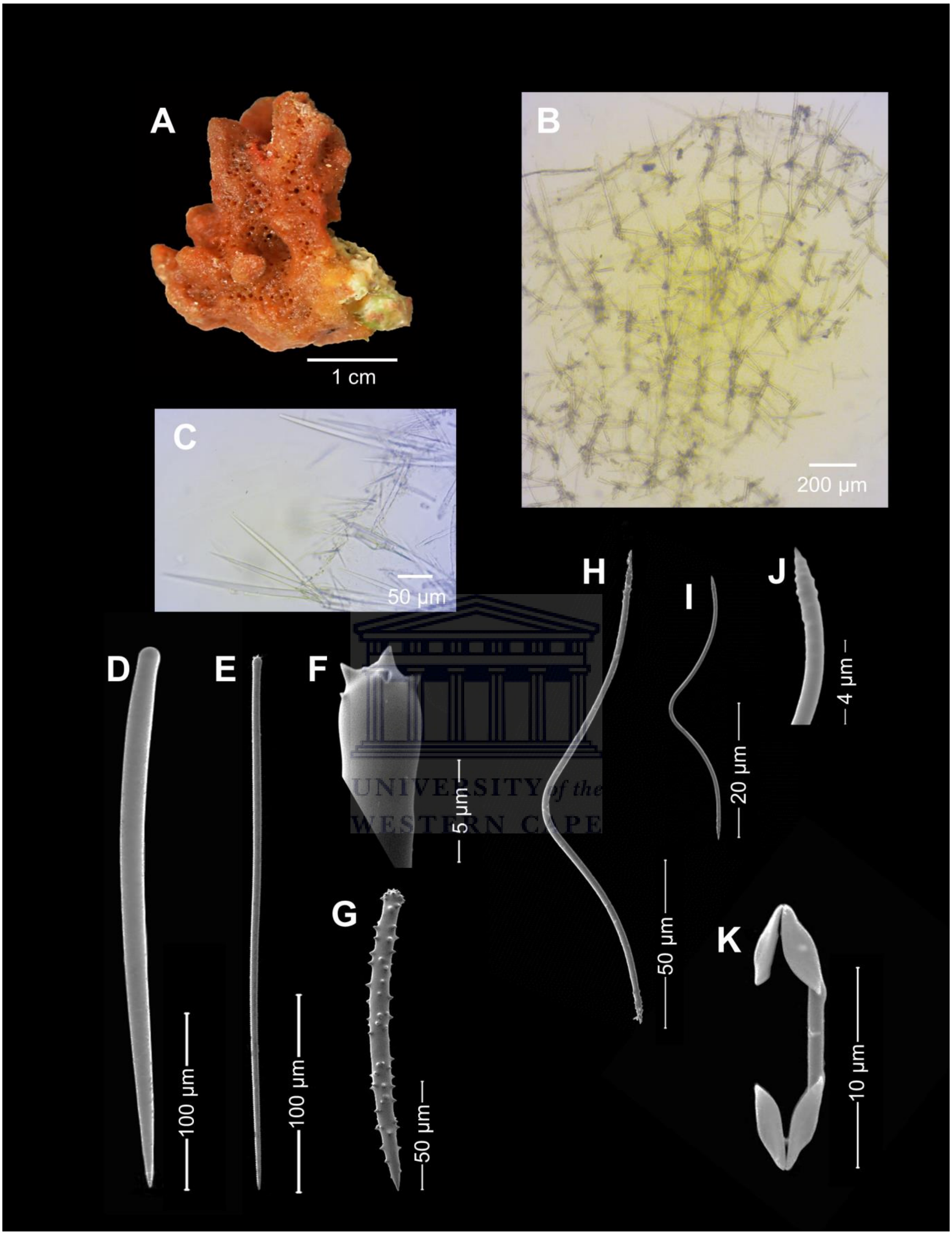


Fig. 13: A – *Clathria (Clathria)* sp. • B, C – Skeletal architecture. D – Style. E, F – Terminally spined subtylostyle. G – Acanthostyle. H – Toxa I. I, J – Terminally spined Toxa II. K – Isochela.

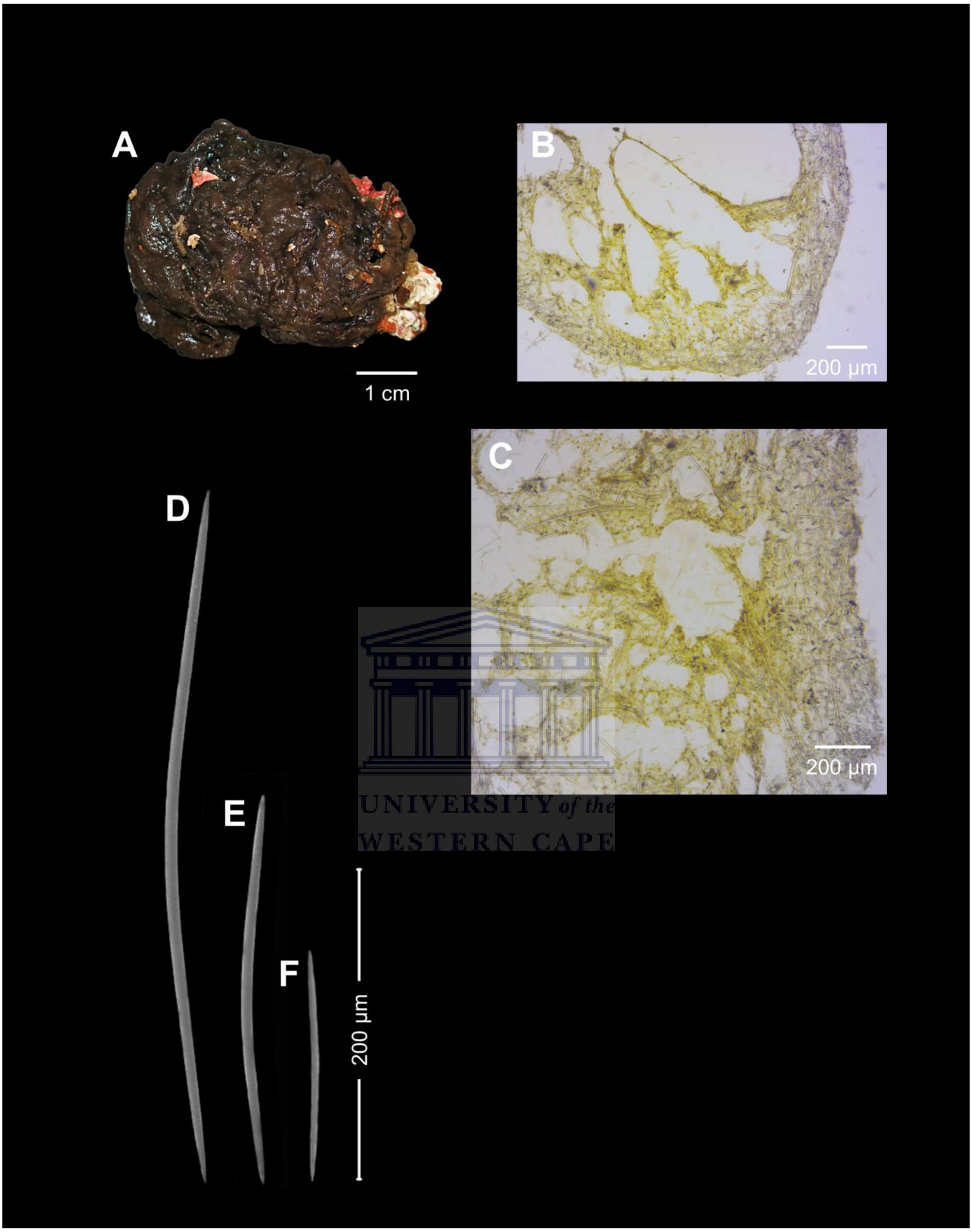


Fig. 14: A – *Halichondria (Halichondria)* sp. • B, C – Skeletal architecture. D – Oxea I. E – Oxea II. F – Oxea III.

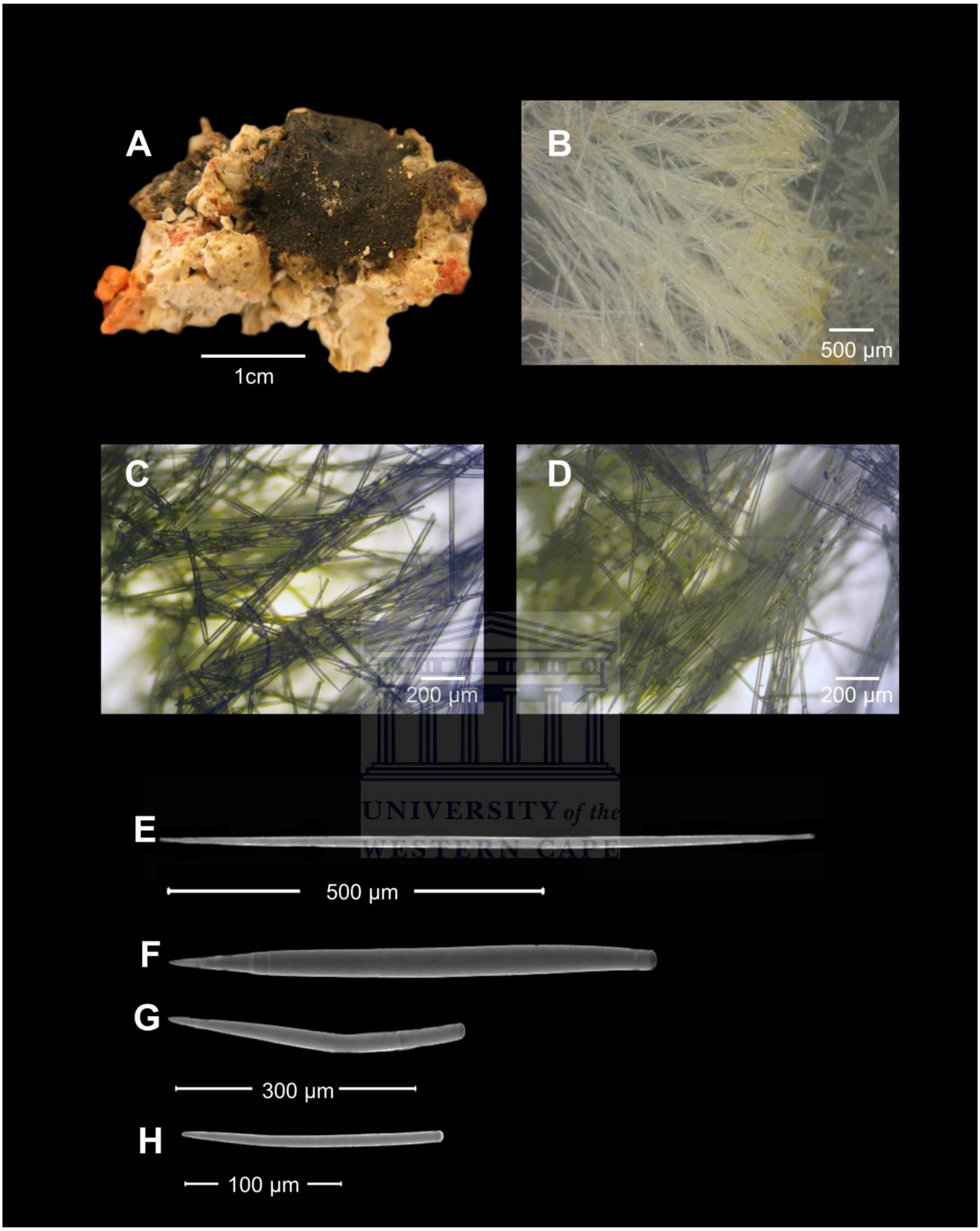


Fig. 15: A – *Aaptos* sp. • B, C, D – Skeletal architecture. E – Stronglyoxea. F – Style I. G – Style II. H – Style III.

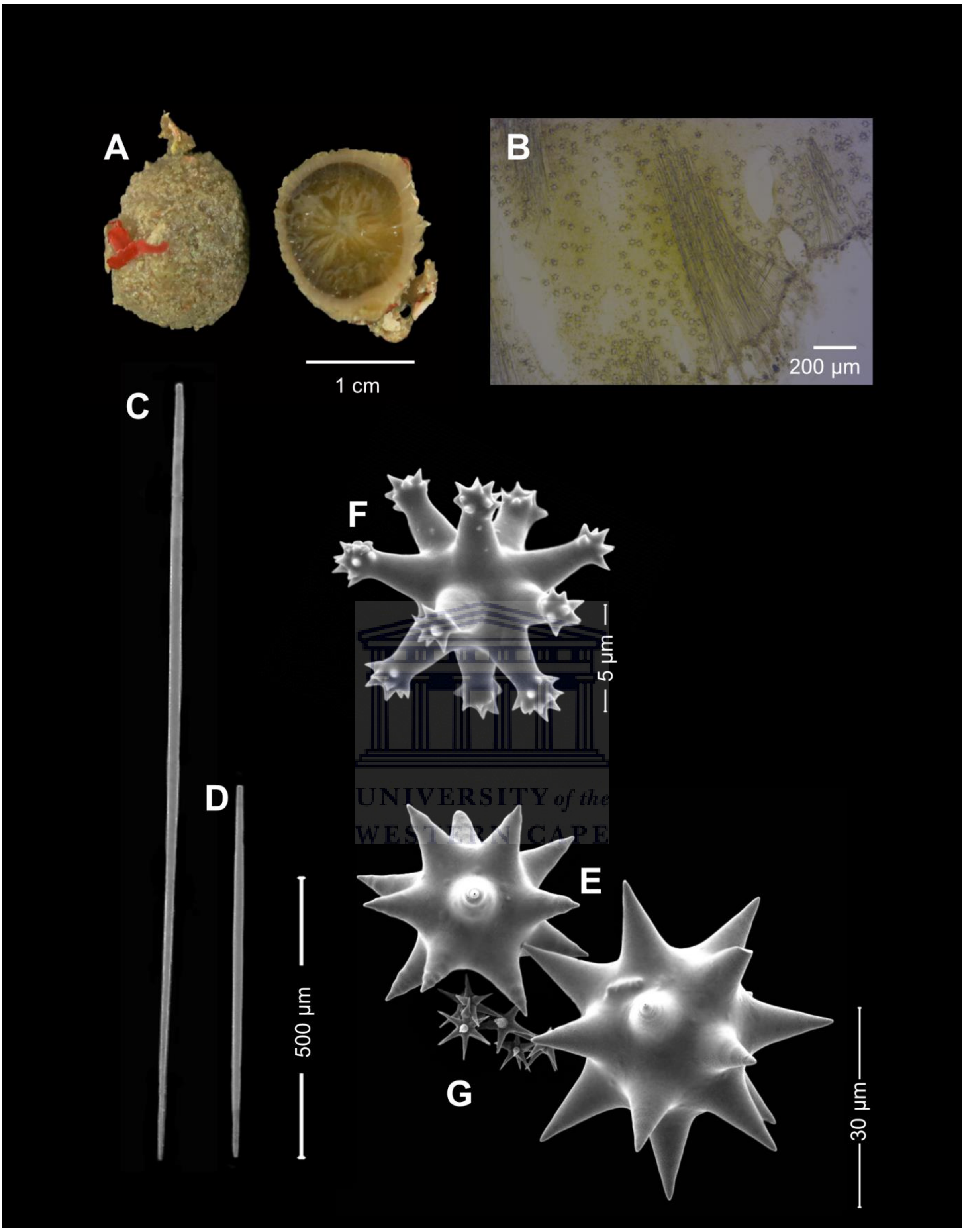


Fig. 16: A – *Tethya* sp. • B – Skeletal architecture. C – Anisostrongyloxea. D – Strongyle. E – Spherasters. F – Tylaster. G – Spheroxyasters.

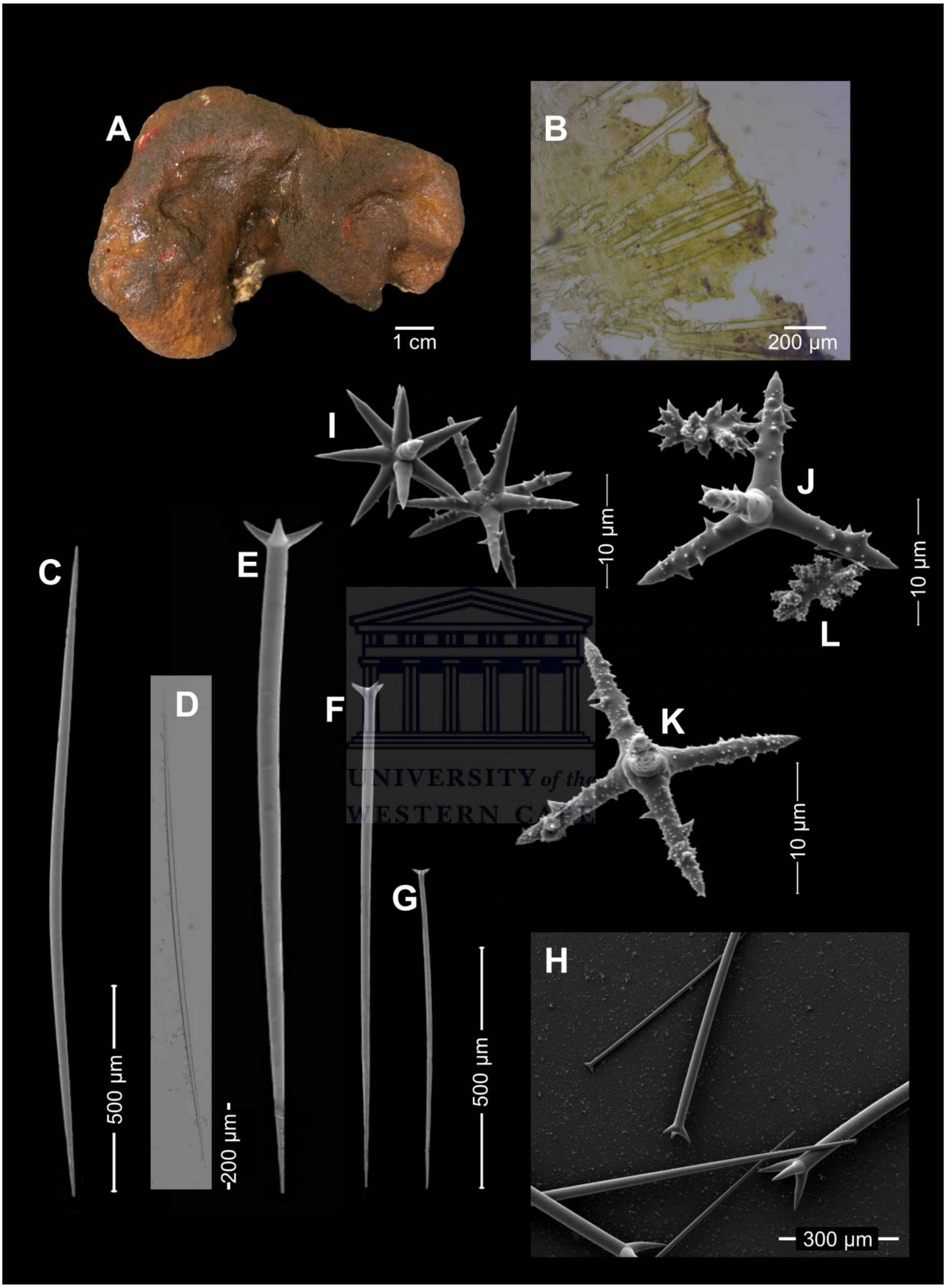


Fig. 17: A – *Ancorina* sp. • B – Skeletal architecture. C – Oxea I. D – Oxea II. E – Plagiotriaene I. F – Plagiotriaene II. G – Plagiotriaene III. H – Plagiotriaene extremities. I – Oxyasters. J – Acanthoxyaster. K – Acanthoxyaster (reduced tetract). L – Sanidaster.

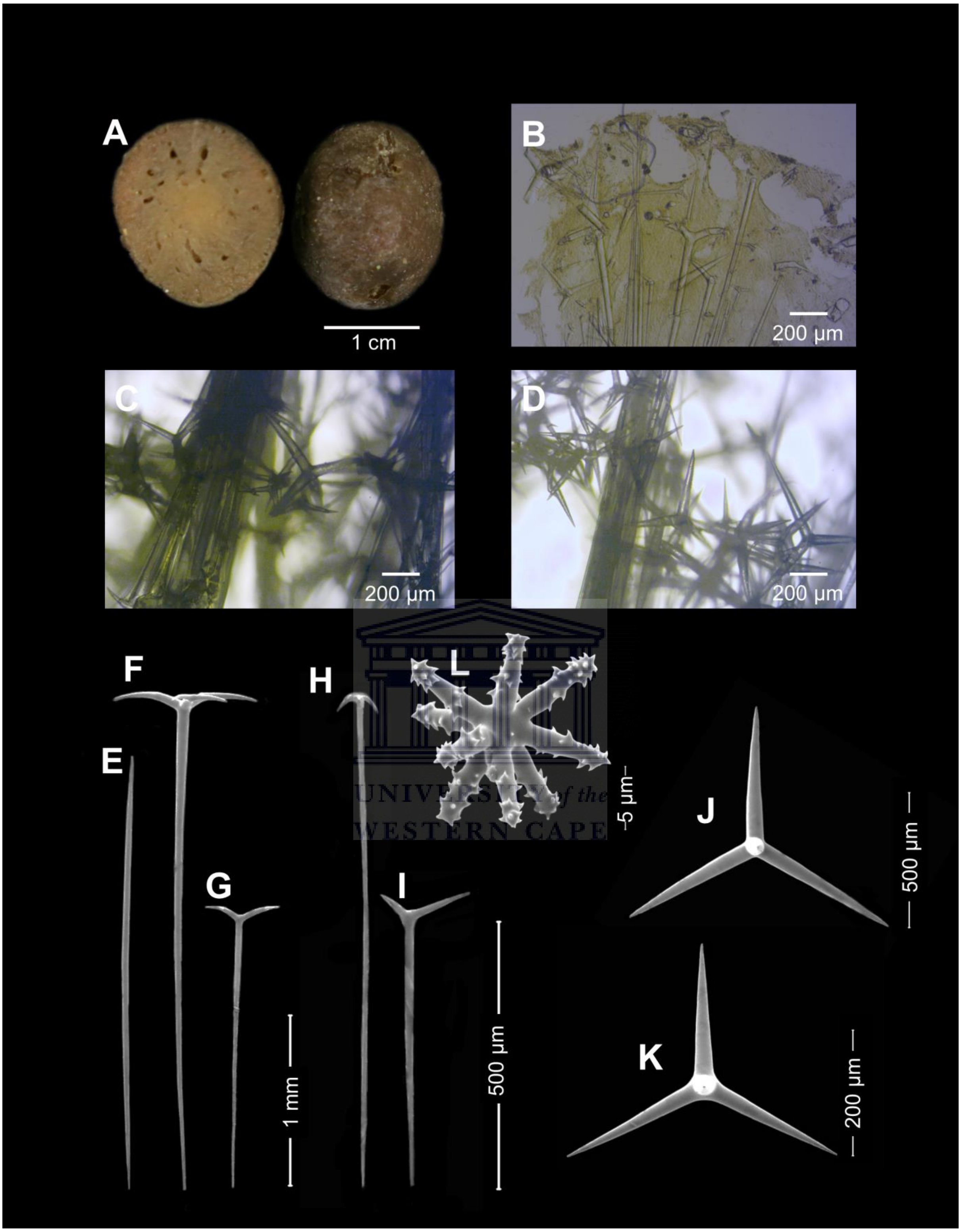


Fig. 18: A – *Chelotropella* sp. • B, C, D – Skeletal architecture. E – Oxea. F – Dichotriaene I. G – Dichotriaene II. H – Anatriaene. I – Plagiotriaene. J – Calthrop I. K – Calthrop II. L – Strongyloacanthaster.

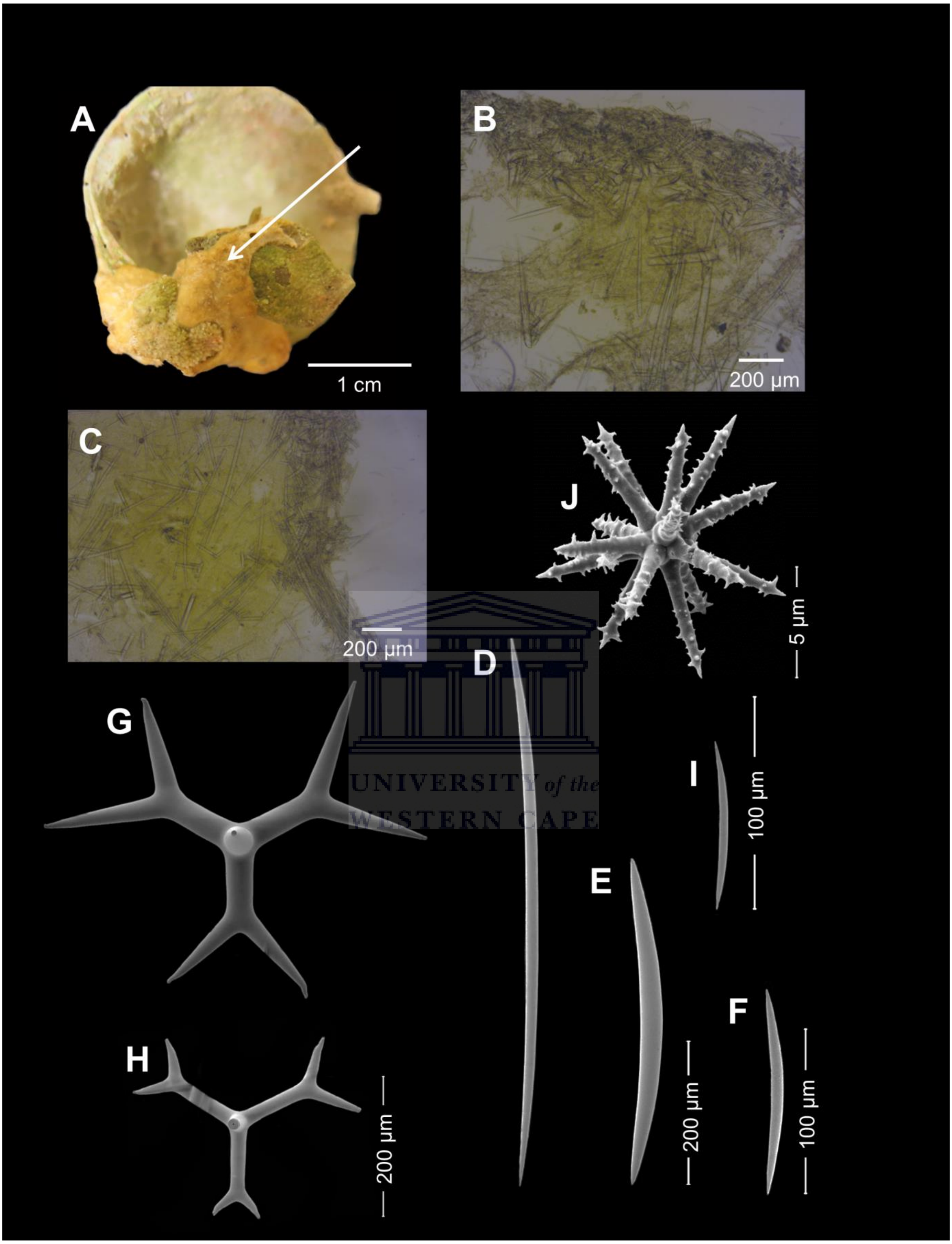


Fig. 19: A – *Penares intermedia* (Dendy, 1905). B, C – Skeletal architecture. D – Oxea I. E – Oxea II. F – Oxea III. G – Dichotriaene I. H – Dichotriaene II. I – Microxea. J – Acanthoxyaster.

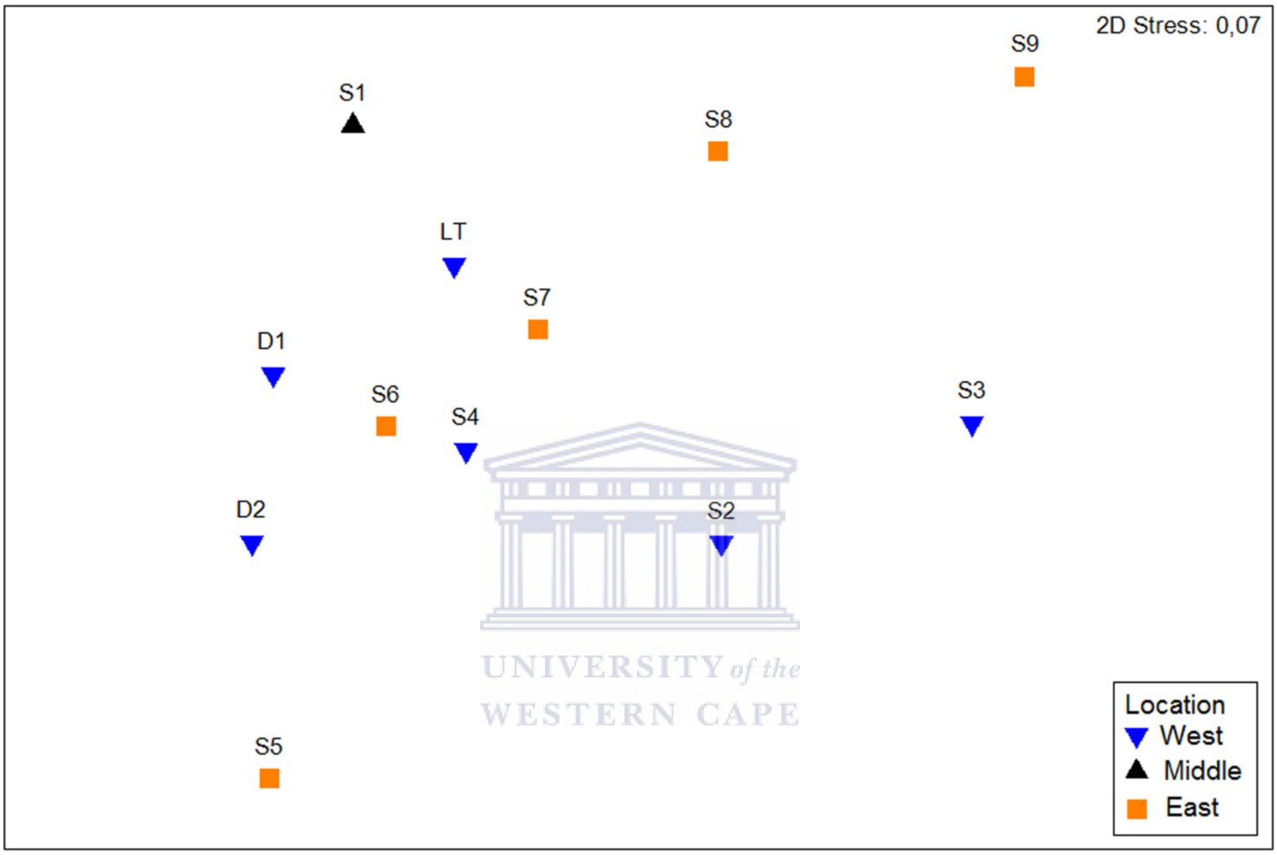


Fig. 20: Non-metric MDS ordination of sampling locations according to location (western vs. eastern flank) on Walters Shoal Seamount, where S = Sled, D = Dive and LT = Lobster Trap.

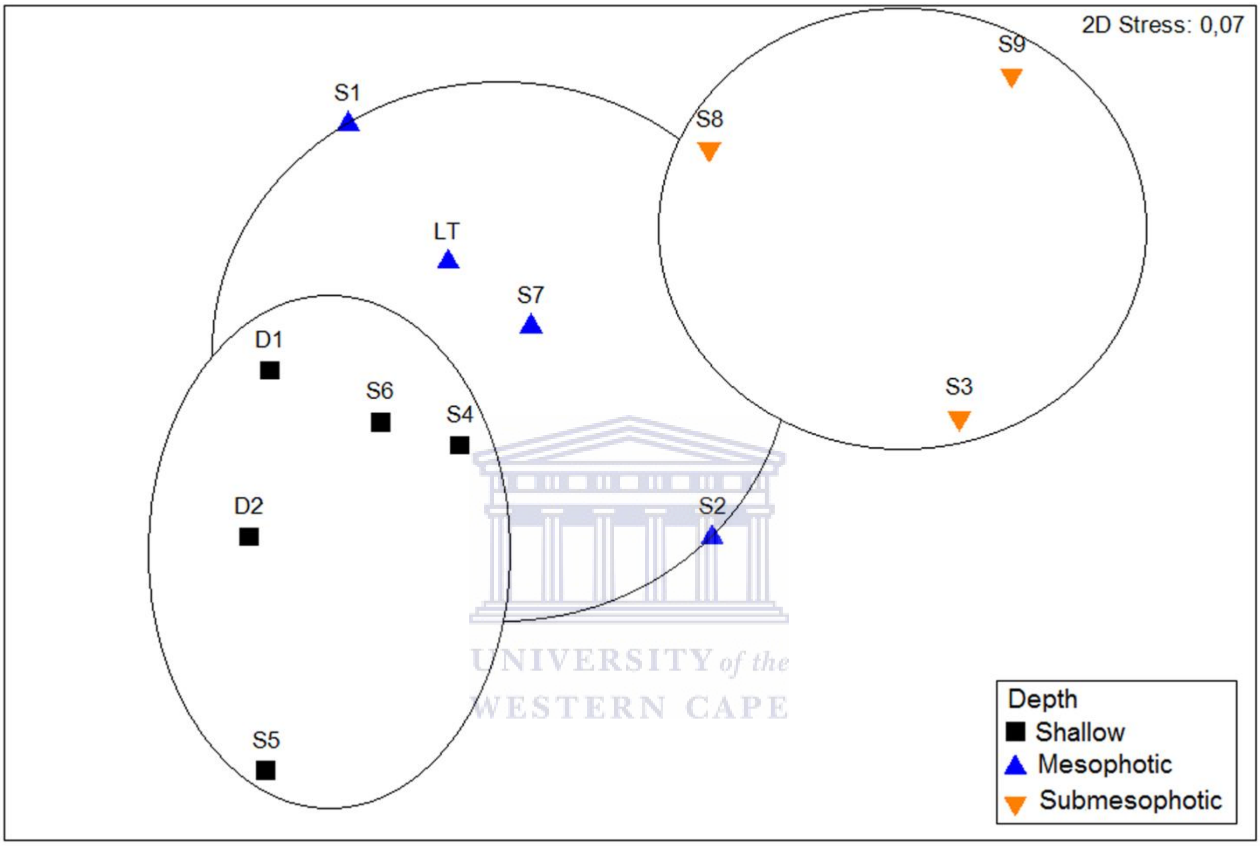


Fig. 21: Non-metric MDS ordination of sampling locations according to depth (Shallow: 15 – 30 m, Mesophotic: 31 – 150 m, Submesophotic: >150 m) on Walters Shoal Seamount, where S = Sled, D = Dive and LT = Lobster Trap.

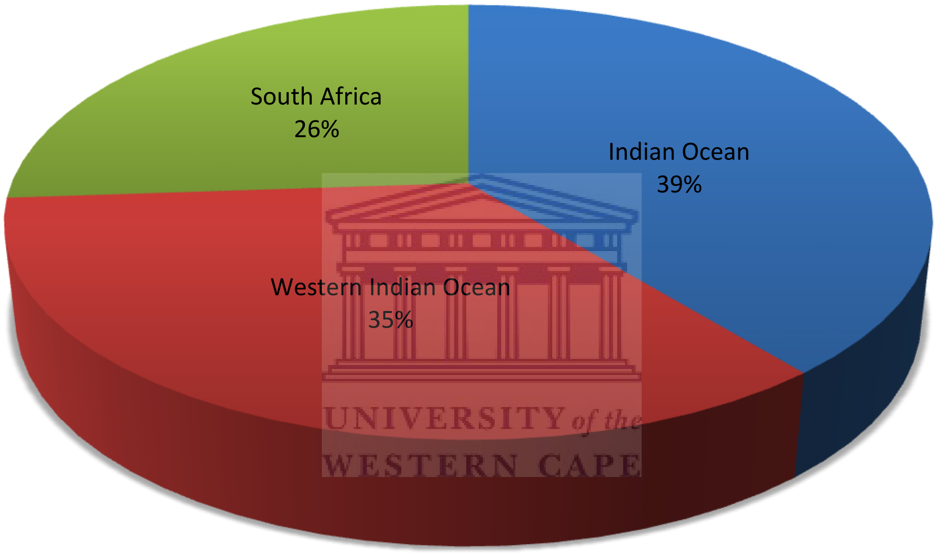


Fig. 22: Biogeographical affinities of the 23 known sponge species recorded from Walters Shoal Seamount.

Fig. 23: Image depicting the low spatial complexity and growth profile of Walters Shoal Seamount (© Imtiyaaz Malick).

Table 1: Invertebrate (including sponge) collection sampling strategy, where depth zone is denoted by the symbols S (Shallow: 15 – 30 m), M (Mesophotic: 31 – 150 m) and SM (Submesophotic: >150 m) according to Lesser *et al*. (2009).

Date	Grid no.	Station no.	Position (start)	Position (end)	Method (# sponges)	Station (open/closed) Duration (min)	Depth (m) Zone
29/05	WSL021	ALG10953	33°11.0' S 43°53.9' E	33°11.0' S 43°52.9' E	Sled 1 4	08:48/09:28 40	53 – 43 M
	WSL022	ALG10954	33°10.9' S 43°48.6' E	33°11.2' S 43°50.2' E	Sled 2 31	10:59/11:40 41	170 – 72 M
	WSL024	ALG10956	33°08.8' S 43°49.1' E	33°09.0' S 43°50.5' E	Sled 3 55	17:05/17:38 33	348 – 103 SM
30/05	–	–	33°11.2' S 43°50.7' E	–	Dive 1[2] 21	11:44/12:19 35	29 S
	–	–	33°10.6' S 43°51.0' E	–	Dive 2 9	13:24/14:00 36	29 S
	WSL042	ALG10974	33°11.2' S 43°51.0' E	33°11.2' S 43°50.7' E	Sled 4 40	13:15/13:25 10	34 – 28 S
02/06	WSL043	ALG10975	33°13.8' S 43°55.5' E	33°13.1' S 43°55.8' E	Sled 5 13	14:24/14:35 11	28 – 30 S
	WSL044	ALG10976	33°14.0' S 43°55.5' E	33°13.7' S 43°55.6' E	Sled 6 30	15:05/15:14 9	28 – 25 S
	WSL045	ALG10977	33°13.8' S 43°56.1' E	33°14.2' S 43°55.9' E	Sled 7 7	15:34/15:50 16	80 M
03/06	WSL046	ALG10978	33°09.8' S 43°56.6' E	33°09.8' S 43°56.2' E	Sled 8 23	10:52/11:17 25	240 – 120 SM
	WSL047	ALG10979	33°09.7' S 43°58.4' E	33°09.8' S 43°57.0' E	Sled 9 14	11:44/12:34 50	512 – 317 SM
05/06	–	–	33°11.6' S 43°50.5' E	–	Lobster Trap 8	09:40/15:08 328	39 M

[2] Four divers were present in each dive. The second dive was more focused on the fish fauna of the seamount.

Table 2: Microwave 5mm/2 layer method for sponge specimen histology processing.

	Step	Time (min)	Temperature (°C)	Pressure (mBar)	Agent
Dehydrate	1. Fixation	105	50		70% ethanol
	2. Flushing	2	37		60% ethanol
	3. Rinsing	30	45		Absolute alcohol
	4. Ethanol	45	55		Absolute alcohol
Clean	5. Xylene	90	50		Xylene
	6. Isopropanol	20	60		Isopropanol
Dry	7. Vaporization	1.5		600	N/A
Harden for wax	8. Wax Impregnation	140	70	995 – 150	N/A

Table 3: Ecoregions included in the biogeographical analyses. Categorisation follows Spalding *et al*. (2007), with numbers in brackets indicating the number of sponge species recorded in each ecoregion, compiled from the World Porifera Database (van Soest *et al*. 2015). Ecoregions 101 and 217 were excluded as they had one and zero sponge species recorded respectively. Vema Seamount is also included (affiliated with West Wind Drift Islands Province). Last updated May 2015.

Western Indo-Pacific Realm	
20. *Western Indian Ocean Province*	
94.	Northern Monsoon Current Coast Ecoregion (44)
95.	East African Coral Coast Ecoregion (172)
96.	Seychelles Ecoregion (147)
97.	Cargados Carajos/Tromelin Island Ecoregion (27)
98.	Mascarene Islands Ecoregion (35)
99.	Southeast Madagascar Ecoregion (4)
100.	Western and Northern Madagascar Ecoregion (150)
101.	Bight of Sofala/Swamp Coast Ecoregion (1) **(excluded)**
102.	Delagoa Ecoregion (34)
Temperate South America Realm	
49. *Tristan Gough Province*	
189.	Tristan Gough Ecoregion (21)
Temperate Southern Africa Realm	
50. *Benguela Province*	
190.	Namib Ecoregion **(excluded)**
191.	Namaqua Ecoregion (138)
51. *Agulhas Province*	
192.	Agulhas Bank Ecoregion (131)
193.	Natal Ecoregion (101)
52. *Amsterdam–St Paul Province*	
194.	Amsterdam-St Paul Ecoregion (8)
Southern Ocean Realm	
59. *Subantarctic Islands Province*	
212.	Macquarie Island Ecoregion **(excluded)**
213.	Heard and Macdonald Islands Ecoregion (7)
214.	Kerguelen Islands Ecoregion (63)
215.	Crozet Islands Ecoregion (8)
216.	Prince Edward Islands Ecoregion (18)
217.	Bouvet Island Ecoregion (0) **(excluded)**
218.	Peter the First Island Ecoregion **(excluded)**
61. *Continental High Antarctic Province*	
224.	East Antarctic Wilkes Land Ecoregion (174)
225.	East Antarctic Enderby Land Ecoregion (8)
226.	East Antarctic Dronning Maud Land Ecoregion (7)
227.	Weddell Sea Ecoregion (71)
228.	Amundsen/Bellingshausen Sea Ecoregion **(excluded)**
229.	Ross Sea Ecoregion **(excluded)**
Other	
Vema Seamount (13)	

Table 4: Sponge species documented from Walters Shoal Seamount per sampling location (S = Sled, D = Dive, LT = Lobster Trap), where (X) indicates presence and (–) indicates absence. The symbol (•) denotes all species that are likely new to science.

Species	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**	**S9**	**D1**	**D2**	**LT**
Aaptos sp. •	–	–	–	X	–	–	–	–	–	–	–	–
Agelas ceylonica	–	X	X	–	–	–	–	–	–	–	–	–
Amorphinopsis (?) sp.	–	–	X	–	–	–	–	–	–	–	–	–
Amorphinopsis cf. *fistulosa*	–	–	–	X	–	X	–	–	–	–	–	X
Ancorina sp. •	–	–	–	X	–	–	–	–	–	–	–	–
Axinellidae sp.	–	–	–	–	–	–	–	–	X	–	–	–
Axinyssa cf. *aplysinoides*	–	–	–	–	–	–	–	X	–	–	–	–
Biemna bihamigera	–	X	X	–	–	–	–	–	–	–	–	–
Brachiaster (?) sp.	–	–	–	–	–	–	–	–	X	–	–	–
Bubaridae sp.	–	–	X	–	–	–	–	–	–	–	–	–
Callyspongia (Toxochalina) cf. *robusta*	X	X	–	X	–	X	–	X	–	–	–	X
Callyspongia (Callyspongia) sp. •	–	–	–	X	–	X	X	–	–	X	X	–
Chelotropella sp. •	–	X	–	–	–	–	–	–	–	–	–	–
Chondrosia cf. *debilis*	–	X	–	–	–	–	–	–	–	–	–	–
Clathria (Clathria) sp. •	–	X	–	X	X	X	–	–	–	–	–	–
Clathrinida sp. 1	–	X	–	–	–	–	–	–	–	–	–	–
Clathrinida sp. 2	–	–	–	–	–	X	–	–	–	–	–	–
Desmanthus sp. •	–	–	–	–	–	–	–	X	–	–	–	–
Dictyoceratida sp.	–	–	–	–	–	–	–	X	–	–	–	–
Dictyodendrilla cf. *pallasi*	–	–	–	–	–	X	–	–	–	–	–	–
Discodermia panoplia	–	–	X	–	–	–	–	–	–	–	–	–
Eurypon sp. 1 •	–	–	–	X	–	X	–	–	–	–	–	–
Eurypon sp. 2 •	–	–	–	–	–	–	–	–	X	–	–	–
Fibulia ectofibrosa	–	X	–	X	–	–	–	–	–	–	–	–
Halichondria (Halichondria) sp. •	–	–	–	X	X	X	–	–	–	X	X	–
Haplosclerida sp. 1	–	–	–	X	–	–	–	–	–	–	–	–
Haplosclerida sp. 2	–	–	–	–	X	–	–	–	–	–	–	–
Haplosclerida sp. 3	–	–	–	–	X	–	–	–	–	–	–	–
Haplosclerida sp. 4	–	–	–	–	–	X	–	–	–	–	–	–
Haplosclerida sp. 5	–	–	–	–	–	–	–	X	–	–	–	–
Hymedesmia (Hymedesmia) sp. •	–	–	–	X	–	–	–	–	–	–	–	–
Hymeniacidon sp. •	–	–	X	–	–	–	–	–	–	–	–	–
Hymerhabdia sp. •	–	–	X	–	–	–	–	–	–	–	–	–
Latrunculia (*Biannulata*) sp. •	–	–	X	–	–	–	–	–	–	–	–	–
Lissodendoryx (Lissodendoryx) pygmaea	–	–	–	–	–	–	–	–	–	X	–	–
Microcionidae sp.	–	–	–	–	–	–	–	X	–	–	–	–
Paradesmanthus sp. •	–	–	–	–	–	–	–	–	X	–	–	–
Penares intermedia	–	X	X	–	–	–	–	–	–	–	–	–

Species	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**	**S9**	**D1**	**D2**	**LT**
Phakellia sp. 1 •	–	–	X	–	–	–	X	–	X	–	–	–
Phakellia sp. 2 •	–	–	X	–	–	–	–	X	–	–	–	–
Phakellia sp. 3 •	–	–	X	–	–	–	–	–	–	–	–	–
Phorbas cf. *frutex*	–	X	–	–	–	–	–	–	–	–	–	–
Poecillastra compressa	–	X	X	–	–	–	–	–	–	–	–	–
Poecilosclerida sp.	–	–	–	–	–	–	–	X	–	–	–	–
Protosuberites sp. 1 •	–	–	X	–	–	–	–	–	–	–	–	–
Protosuberites sp. 2 •	–	–	X	–	–	–	–	–	–	–	–	–
Protosuberites sp. 3 •	–	–	–	–	–	–	–	X	X	–	–	–
Ptilocaulis sp. •	–	–	X	–	–	–	–	–	X	–	–	–
Raspailiidae sp.	–	X	–	–	–	–	–	–	–	–	–	–
Rhabderemia sp. •	–	–	X	–	–	–	–	X	X	–	–	–
Spongosorites sp. •	–	X	–	–	–	–	X	X	–	–	–	–
Stelletta agulhana	–	–	–	–	–	–	–	–	–	X	–	–
Stelletta cf. *cylindrica*	–	–	–	–	–	–	–	X	–	–	–	–
Stelletta purpurea	–	–	–	X	–	X	X	X	–	X	X	X
Stelletta tulearensis	–	X	–	–	–	–	X	–	–	–	–	–
Stryphnus progressus	–	–	X	–	–	–	–	–	–	–	–	–
Tedania (Tedania) sansibarensis	–	–	–	–	–	–	–	–	–	–	X	–
Tedania (Tedania) tubulifera	–	X	–	–	–	–	–	–	–	–	–	–
Terpios cruciata	–	–	–	X	–	–	–	–	–	–	–	–
Tethya sp. •	X	X	–	X	–	X	X	–	–	X	–	X
Thrombus sp. •	–	–	X	–	–	–	–	–	–	–	–	–
Timea cf. *spherastraea*	–	–	–	–	–	–	–	X	–	–	–	–
Verongiida sp.	–	X	–	–	–	–	–	–	–	–	–	–
Vulcanella sp. •	–	–	–	–	–	–	–	–	X	–	–	–
Zyzzya fuliginosa	–	–	X	–	–	–	–	–	–	–	–	–
Unknowns:												
M1	–	X	X	X	–	–	X	X	–	–	–	X
M2	–	X	–	–	–	–	–	–	–	–	–	–
M3	–	–	–	X	–	–	–	–	–	–	–	–
M4	–	–	–	–	–	–	–	X	–	–	–	–
M5	–	X	–	–	–	–	–	–	–	–	–	–
M6	–	X	–	–	–	–	–	–	–	–	–	–
M7	–	–	–	–	X	–	–	–	–	–	X	–
M8	–	–	–	–	–	–	–	–	X	–	–	–
M9	–	–	–	–	X	–	–	–	–	–	–	–
M10	–	X	–	–	–	–	–	–	–	–	–	–
M11	–	X	–	–	–	–	–	–	–	–	–	–
M12	–	–	–	–	X	–	–	–	–	–	–	–
M13	–	X	–	–	–	–	–	–	–	–	–	–

Table 5: Sponge species documented from Walters Shoal Seamount. Depth range is indicative of sled location depths and thus may not represent the true species depth range. Dive location depths are indicative of true species depth range. The symbol (•) denotes all species that are likely new to science. Specimens that could only be identified to a higher taxonomic level (i.e. order, family) are denoted as sp. Unknowns represent morphospecies that were included in the depth and location analyses but require further investigation for identification. Classification and distribution records follow the World Porifera Database (van Soest *et al*. 2015).

	No. of specimens	Location	Depth Range (m)	Distribution
Kingdom Animalia **Phylum Porifera Grant, 1836**				
Class Calcarea Bowerbank, 1862 **Subclass Calcinea Bidder, 1898**				
Order Clathrinida Hartman, 1958				
1. Clathrinida sp. 1	1	S2	72 – 170	Walters Shoal Seamount
2. Clathrinida sp. 2	1	S6	25 – 28	Walters Shoal Seamount
Class Demospongiae Sollas, 1885 **Subclass Heteroscleromorpha Cárdenas, Perez & Boury–Esnault, 2012**				
Order Agelasida Hartman, 1980 Family Agelasidae Verrill, 1907				
3. *Agelas ceylonica* Dendy, 1905	9	S2,S3	72 – 348	Found extensively throughout the Indian Ocean
Family Hymerhabdiidae Morrow, Picton, Erpenbeck, Boury–Esnault, Maggs & Allcock, 2012				
4. *Hymerhabdia* sp. •	2	S3	103 – 348	Walters Shoal Seamount
Order Axinellida Lévi, 1953 Family Axinellidae Carter, 1875				

5. Axinellidae sp.	1	S9	317 – 512	Walters Shoal Seamount
6. *Phakellia* sp. 1 •	4	S3,S7,S9	80 – 512	Walters Shoal Seamount
7. *Phakellia* sp. 2 •	4	S3,S8	103 – 348	Walters Shoal Seamount
8. *Phakellia* sp. 3 •	1	S3	103 – 348	Walters Shoal Seamount
9. *Ptilocaulis* sp. •	5	S3,S9	103 – 512	Walters Shoal Seamount
Family Raspailiidae Nardo, 1833				
10. Raspailiidae sp.	2	S2	72 – 170	Walters Shoal Seamount
Subfamily Raspailiinae Nardo, 1833				
11. *Eurypon* sp. 1 •	2	S4,S6	25 – 34	Walters Shoal Seamount
12. *Eurypon* sp. 2 •	1	S9	317 – 512	Walters Shoal Seamount
Order Biemnida Morrow, Redmond, Picton, Thacker, Collins, Maggs, Sigwart, Allcock, 2013 Family Biemnidae Hentschel, 1923				
13. *Biemna bihamigera* (Dendy, 1922)	2	S2,S3	72 – 348	Found extensively throughout the Indian Ocean
Family Rhabderemiidae Topsent, 1928				
14. *Rhabderemia* sp. •	20	S3,S8,S9	103 – 512	Walters Shoal Seamount
Order Bubarida Morrow & Cárdenas, 2015 Family Bubaridae Topsent, 1894b				
15. Bubaridae sp.	1	S3	103 – 348	Walters Shoal Seamount
Family Desmanthidae Topsent, 1894a				
16. *Desmanthus* sp. •	2	S8	120 – 240	Walters Shoal Seamount
17. *Paradesmanthus* sp.•	3	S9	317 – 512	Walters Shoal Seamount
Order Haplosclerida Topsent, 1928				
18. Haplosclerida sp. 1	2	S4	28 – 34	Walters Shoal Seamount
19. Haplosclerida sp. 2	2	S5	28 – 30	Walters Shoal Seamount
20. Haplosclerida sp. 3	1	S5	28 – 30	Walters Shoal Seamount
21. Haplosclerida sp. 4	3	S6	25 – 28	Walters Shoal Seamount
22. Haplosclerida sp. 5	1	S8	120 – 240	Walters Shoal Seamount
Family Callyspongiidae de Laubenfels, 1936				
23. *Callyspongia (Callyspongia)* sp. •	9	S4,S6,S7,D1,D2	25 – 80	Walters Shoal Seamount
24. *Callyspongia (Toxochalina)* cf. *robusta* (Ridley, 1884)	10	S1,S2,S4,S6,S8,LT	25 – 240	Manning-Hawkesbury (Holotype), New

				Zealand, Chatham Island, Australia, Indonesia, Philippines, Natal, Madagascar, Kenya
Order Poecilosclerida Topsent, 1928				
25. Poecilosclerida sp.	1	S8	120 – 240	Walters Shoal Seamount
Family Acarnidae Dendy, 1922				
26. *Zyzzya fuliginosa* (Carter, 1879)	1	S3	103 – 348	Found extensively throughout the Indian Ocean
Family Coelosphaeridae Dendy, 1922				
27. *Lissodendoryx (Lissodendoryx) pygmaea* (Burton, 1931)	5	D1	29	KwaZulu-Natal; South Africa
Family Dendoricellidae Hentschel, 1923				
28. *Fibulia ectofibrosa* (Lévi, 1963)	7	S2,S4	28 – 170	South Africa, Namaqua
Family Hymedesmiidae Topsent, 1928				
29. *Hymedesmia (Hymedesmia)* sp. •	1	S4	28 – 34	Walters Shoal Seamount
30. *Phorbas* cf. *frutex* Pulitzer–Finali, 1993	1	S2	72 – 170	East African Coral Coast, Kenya
Family Latrunculiidae Topsent, 1922				
31. *Latrunculia* (*Biannulata*) sp. •	1	S3	103 – 348	Walters Shoal Seamount
Family Microcionidae Carter, 1875				
32. Microcionidae sp.	1	S8	120 – 240	Walters Shoal Seamount
Subfamily Microcioninae Carter, 1875				
33. *Clathria (Clathria)* sp. •	8	S2,S4,S5,S6	25 – 170	Walters Shoal Seamount
Family Tedaniidae Ridley & Dendy, 1886				
34. *Tedania (Tedania) sansibarensis* Baer, 1906	1	D2	29	Zanzibar, Tanzania
35. *Tedania (Tedania) tubulifera* Lévi, 1963	1	S2	72 – 170	South Africa, Namaqua
Order Suberitida Chombard & Boury–Esnault, 1999 Family Halichondriidae Gray, 1867				
36. *Amorphinopsis* (?) sp.	1	S3	103 – 348	Walters Shoal Seamount
37. *Amorphinopsis* cf. *fistulosa* (Vacelet, Vasseur & Lévi, 1976)	4	S4,S6,LT	25 – 39	Madagascar
38. *Axinyssa* cf. *aplysinoides* (Dendy, 1922)	1	S8	120 – 240	Found extensively

				throughout Western Indian Ocean
39. *Halichondria (Halichondria)* sp.•	30	S4,S5,S6,D1,D2	25 – 34	Walters Shoal Seamount
40. *Hymeniacidon* sp.	4	S3	103 – 348	Walters Shoal Seamount
41. *Spongosorites* sp.•	3	S2,S7,S8	72 – 240	Walters Shoal Seamount
Family Suberitidae Schmidt, 1870				
42. *Aaptos* sp.•	2	S4	28 – 34	Walters Shoal Seamount
43. *Protosuberites* sp. 1•	2	S3	103 – 348	Walters Shoal Seamount
44. *Protosuberites* sp. 2•	1	S3	103 – 348	Walters Shoal Seamount
45. *Protosuberites* sp. 3•	3	S8,S9	120 – 512	Walters Shoal Seamount
46. *Terpios cruciata* (Dendy, 1905)	2	S4	28 – 34	Found extensively throughout the Indian Ocean
Order Tethyida Morrow & Cárdenas, 2015 Family Tethyidae Gray, 1848				
47. *Tethya* sp. •	17	S1,S2,S4,S6,S7,D1,LT	25 – 170	Walters Shoal Seamount
Family Timeidae Topsent, 1928				
48. *Timea* cf. *spherastraea* Burton, 1959	1	S8	120 – 240	East African Coral Coast
Order Tetractinellida Marshall, 1876 Suborder Astrophorina Sollas, 1887 Family Ancorinidae Schmidt, 1870				
49. *Ancorina* sp. •	2	S4	28 – 34	Walters Shoal Seamount
50. *Chelotropella* sp. •	1	S2	72 – 170	Walters Shoal Seamount
51. *Stelletta agulhana* Lendenfeld, 1907	1	D1	29	South Africa, Namaqua
52. *Stelletta* cf. *cylindrica* Thomas, 1973	1	S8	120 – 240	Seychelles
53. *Stelletta purpurea* Ridley, 1884	17	S4,S6,S7,S8,D1,D2,LT	25 – 240	Found extensively throughout Pacific and Indian Ocean
54. *Stelletta tulearensis* Vacelet, Vasseur & Lévi, 1976	2	S2,S7	72 – 170	Madagascar (Holotype), Kenya
55. *Stryphnus progressus* (Lendenfeld, 1907)	1	S3	103 – 348	South Africa
Family Geodiidae Gray, 1867 Subfamily Erylinae Sollas, 1888				
56. *Penares intermedia* (Dendy, 1905)	10	S2,23	72 – 348	Sri Lanka (Holotype),

				Zanzibar, Kenya
Family Pachastrellidae Carter, 1875				
57. *Brachiaster* (?) sp.	1	S9	317 – 512	Walters Shoal Seamount
Family Theonellidae Lendenfeld, 1903				
58. *Discodermia panoplia* Sollas, 1888	1	S3	103 – 348	Indonesia (Kai Islands: Holotype), Madagascar
Family Thrombidae Sollas, 1888				
59. *Thrombus* sp. •	1	S3	103 – 348	Walters Shoal Seamount
Family Vulcanellidae Cárdenas, Xavier, Reveillaud, Schander & Rapp, 2011				
60. *Poecillastra compressa* (Bowerbank, 1866)	4	S2,S3	72 – 348	North Atlantic, West Africa, South Africa
61. *Vulcanella* sp. •	1	S9	317 – 512	Walters Shoal Seamount
Subclass Keratosa Grant, 1861 **Order Dendroceratida Minchin, 1900** Family Dictyodendrillidae Bergquist, 1980				
62. *Dictyodendrilla* cf. *pallasi* (Ridley, 1884)	1	S6	25 – 28	Seychelles (Holotype), Falkland Islands, Antarctic Ocean
Order Dictyoceratida Minchin, 1900				
63. Dictyoceratida sp.	1	S8	120 – 240	Walters Shoal Seamount
Subclass Verongimorpha Erpenbeck, Sutcliffe, De Cook, Dietzel, Maldonado, Van Soest, Hooper, Wörheide, 2012 **Order Chondrosiida Boury–Esnault & Lopes, 1985** Family Chondrosiidae Schulze, 1877				
64. *Chondrosia* cf. *debilis* Thiele, 1900	1	S2	72 – 170	Indonesia, Saudi Arabia, southern Red Sea, Madagascar
Order Verongiida Bergquist, 1978				
65. Verongiida sp.	1	S2	72 – 170	Walters Shoal Seamount
Unknowns				

66. M1	6	S2,S3,S4,S7,S8,LT	28 – 348	Walters Shoal Seamount
67. M2	1	S2	72 – 170	Walters Shoal Seamount
68. M3	1	S4	28 – 34	Walters Shoal Seamount
69. M4	1	S8	120 – 240	Walters Shoal Seamount
70. M5	1	S2	72 – 170	Walters Shoal Seamount
71. M6	1	S2	72 – 170	Walters Shoal Seamount
72. M7	2	S5,D2	28 – 30	Walters Shoal Seamount
73. M8	1	S9	317 – 512	Walters Shoal Seamount
74. M9	1	S5	28 – 30	Walters Shoal Seamount
75. M10	1	S2	72 – 170	Walters Shoal Seamount
76. M11	1	S2	72 – 170	Walters Shoal Seamount
77. M12	2	S5	28 – 30	Walters Shoal Seamount
78. M13	1	S2	72 – 170	Walters Shoal Seamount

Table 6: Spicule dimensions of four *Agelas ceylonica* Dendy, 1905 specimens from this study, n = 10.

Specimen	Verticillate Acanthostyle I (µm)	Verticillate Acanthostyle II (µm)
TS 2309	190.9 (153.6 – 259.8) x 5.9 (4.3 – 8.3), 13 – 23 whorls	116.9 (84.0 – 140.2) x 5.7 (4.7 – 7.1), 11 – 16 whorls
TS 2313	191.5 (163.9 – 216.5) x 9.0 (6.3 – 11.0), 15 – 22 whorls	115.6 (89.6 – 148.0) x 4.3 (3.1 – 5.5), 12 – 17 whorls
TS 2317	192.5 (159.6 – 259.3) x 7.4 (6.4 – 9.2), 12 – 22 whorls	121.7 (90.2 – 141.5) x 4.9 (4.0 – 5.7), 11 – 16 whorls
TS 2441	229.3 (163.5 – 302.5) x 7.6 (6.1 – 10.1), 14 – 20 whorls	132.7 (117.9 – 146.9) x 5.7 (4.6 – 6.4), 11 – 16 whorls

Table 7: Spicule dimensions of four *Ptilocaulis* sp. • specimens from this study, n = 10.

Specimen no.	Style (µm)
TS 2440	462.9 – 1332.8 x 18.8 (15.4 – 22.5)
TS 2448	399.1 – 1197.0 x 15.8 (9.4 – 19.0)
TS 2458	364.1 – 1571.8 x 17.6 (13.6 – 22.4)
TS 2546	390.5 – 1285.1 x 17.6 (11.8 – 22.7)
TS 2570	497.6 – 1413.6 x 18.1 (14.2 – 26.9)

Table 8: Spicule dimensions of four *Callyspongia (Callyspongia)* sp. • specimens from this study, n = 10.

Specimen	Oxea (µm)
TS 2330	69.2 (61.7 – 75.9) x 3.5 (3.0 – 4.2)
TS 2341	64.5 (55.9 – 68.9) x 3.4 (2.6 – 4.0)
TS 2353	66.0 (58.3 – 74.9) x 3.0 (2.4 – 3.7)
TS 2369	62.4 (56.6 – 68.8) x 3.0 (2.3 – 4.2)

Table 9: Spicule dimensions of four *Lissodendoryx (Lissodendoryx) pygmaea* (Burton, 1931) specimens from this study, n = 10.

Specimen	Tylote (µm)	Style (µm)	Sigma (µm)	Chela I (µm)	Chela II (µm)
TS 2364	181.5 (164.4 – 196.4) x 4.5 (3.5 – 5.1)	125.6 (116.8 – 137.5) x 6.0 (4.4 – 6.8)	28.6 (26.4 – 31.1)	23.8 (22.4 – 25.0)	13.2 (12.1 – 14.1)
TS 2365	202.8 (185.0 – 214.3) x 4.7 (3.3 – 6.1)	138.3 (131.2 – 143.2) x 6.2 (5.9 – 6.7)	28.5 (23.4 – 32.2)	25.0 (22.9 – 26.0)	12.9 (11.2 – 14.6)
TS 2366	201.0 (190.2 – 206.9) x 4.8 (3.6 – 5.6)	135.5 (128.7 – 141.8) x 5.3 (4.7 – 6.1)	28.6 (27.1 – 30.3)	23.8 (20.2 – 25.3)	13.5 (12.7 – 14.4)
TS 2367	196.6 (189.3 – 203.4) x 4.2 (3.2 – 5.0)	135.4 (125.0 – 140.7) x 5.6 (4.8 – 6.0)	29.2 (26.2 – 32.2)	23.5 (22.0 – 25.0)	12.7 (11.1 – 13.9)

Table 10: Spicule dimensions of four *Fibulia ectofibrosa* (Lévi, 1963) specimens from this study, n = 10.

Specimen	Oxea (µm)	Chela (µm)
TS 2303	336.8 (307.0 – 389.3) x 7.6 (5.4 – 9.8)	13.9 (12.7 – 15.4)
TS 2472	316.2 (282.3 – 342.3) x 6.2 (4.2 – 7.7)	13.9 (12.4 – 15.4)
TS 2473	334.1 (281.3 – 386.0) x 6.0 (3.6 – 7.7)	13.5 (12.5 – 14.5)
TS 2477	363.1 (303.1 – 412.8) x 6.8 (3.6 – 9.3)	13.4 (12.3 – 14.5)

Table 11: Spicule dimensions of four *Clathria (Clathria)* sp. • specimens from this study, n = 10.

Specimen	Style (µm)	Subtylostyle (µm)	Acanthostyle (µm)	Toxa I (µm)	Toxa II (µm)	Chela (µm)
TS 2302	248.4 (204.2 – 307.1) x 10.9 (8.5 – 13.1)	217.7 (138.9 – 319.1) x 3.3 (2.8 – 3.8)	145.3 (134.8 – 153.6) x 8.2 (4.8 – 9.3)	144.7 (121.4 – 160.4)	50.7 (35.0 – 84.3)	13.5 (11.8 – 15.0)
TS 2342	234.3 (178.7 – 320.0) x 9.3 (7.9 – 11.5)	211.4 (129.7 – 313.1) x 3.0 (2.4 – 3.8)	138.0 (132.2 – 148.0) x 7.3 (5.6 – 9.7)	146.1 (111.0 – 177.2)	45.1 (35.3 – 61.1)	12.5 (11.2 – 14.2)
TS 2348	247.1 (194.7 – 354.4) x 9.9 (8.3 – 11.8)	218.5 (119.2 – 309.8) x 2.8 (2.0 – 3.8)	139.0 (131.4 – 150.1) x 7.7 (5.3 – 8.9)	143.7 (113.8 – 177.3)	41.3 (27.2 – 55.4)	12.8 (11.6 – 14.1)
TS 2355	228.5 (181.8 – 318.7) x 7.7 (6.1 – 10.0)	230.2 (145.0 – 311.4) x 2.4 (2.1 – 3.0)	139.6 (123.4 – 155.1) x 6.7 (5.3 – 8.4)	113.6 (72.6 – 163.0)	45.7 (33.9 – 62.0)	13.8 (12.9 – 15.1)

Table 12: Spicule dimensions of four *Halichondria (Halichondria)* sp. • specimens from this study, n = 10.

Specimen	Oxea I (µm)	Oxea II (µm)	Oxea III (µm)
TS 2336	415.5 (315.6 – 469.1) x 7.9 (6.7 – 9.4)	239.8 (203.3 – 284.5) x 6.6 (4.4 – 9.6)	155.0 (113.4 – 173.1) x 6.0 (4.2 – 7.9)
TS 2338	435.5 (377.5 – 513.7) x 11.6 (8.5 – 13.6)	255.7 (209.5 – 287.3) x 8.1 (6.7 – 9.6)	136.8 (114.8 – 161.7) x 5.7 (4.8 – 6.5)
TS 2339	403.3 (349.9 – 461.6) x 9.9 (6.2 – 13.6)	232.0 (208.0 – 288.4) x 7.7 (5.7 – 9.2)	145.3 (112.5 – 198.6) x 6.1 (5.0 – 7.4)
TS 2340	444.2 (418.3 – 474.1) x 10.8 (8.5 – 13.3)	238.4 (211.3 – 274.8) x 7.2 (5.7 – 8.9)	127.2 (120.1 – 142.2) x 5.2 (4.4 – 6.2)

Table 13: Spicule dimensions of *Aaptos* sp. • specimens from this study, n = 10.

Specimen	Stronglyoxea (µm)	Style I (µm)	Style II (µm)	Style III (µm)
TS 2502	954.4 (677.5 – 1284.6) x 14.1 (7.5 – 20.0)	875.8 (674.1 – 1252.4) x 27.4 (23.6 – 32.3)	446.0 (348.3 – 576.4) x 14.9 (8.9 – 19.7)	188.3 (127.5 – 291.1) x 5.0 (3.0 – 6.9)
TS 2503	981.2 (682.8 – 1253.7) x 21.3 (16.1 – 28.4)	939.0 (600.9 – 1282.3) x 24.9 (17.4 – 35.5)	417.5 (340.1 – 496.4) x 11.1 (8.1 – 16.1)	201.5 (117.1 – 291.2) x 5.6 (3.3 – 9.0)

Table 14: Spicule dimensions of four *Tethya* sp. • specimens from this study, n = 10.

Specimen	Anisostrongyloxea (µm)	Strongyle (µm)	Spheraster (µm)	Tylaster (µm)	Spheroxyaster (µm)
TS 2311	285.3 – 1225.0 x 11.1 (3.0 – 20.1)	733.0 (355.5 – 1124.0) x 14.4 (7.4 – 21.8)	45.7 (27.5 – 58.5)	13.9 (12.4 – 15.1)	6.2 (4.3 – 7.7)
TS 2327	339.1 – 1455.3 x 12.3 (4.2 – 24.3)	1021.3 (522.2 – 1461.7) x 17.4 (12.3 – 23.6)	57.3 (37.8 – 74.8)	11.9 (10.4 – 13.9)	6.7 (4.8 – 10.3)
TS 2337	235.5 – 1306.3 x 10.3 (5.0 – 21.8)	1063.8 (758.1 – 1476.3) x 16.4 (8.3 – 21.4)	51.7 (43.0 – 62.1)	12.5 (10.3 – 14.8)	8.7 (3.7 – 12.2)
TS 2358	292.7 – 1280.1 x 10.5 (5.6 – 22.7)	995.6 (595.6 – 1249.3) x 19.2 (9.0 – 24.9)	37.0 (21.3 – 56.0)	12.6 (10.5 – 15.1)	6.2 (5.3 – 7.0)

Table 15: Spicule dimensions of *Ancorina* sp. • specimens from this study, n = 10.

	Spicule Type	TS 2475	TS 2476
	Oxea I (µm)	1748.4 (1276.7 – 2017.8) x 30.3 (16.9 – 36.8)	1764.9 (1521.0 – 2063.3) x 29.9 (20.6 – 39.2)
	Oxea II (µm)	975.5 (727.5 – 1133.7) x 9.1 (6.3 – 12.5)	933.6 (801.1 – 1090.6) x 8.3 (5.5 – 11.8)
Plagiotriaene I	Rhabdome (µm)	1759.8 (1550.3 – 2074.9) x 38.5 (33.4 – 46.5)	1668.9 (1215.6 – 1965.4) x 35.9 (25.0 – 46.7)
	Cladome (µm)	152.3 (130.3 – 175.0)	140.0 (84.5 – 190.0)
	Cladi (µm)	89.9 (75.1 – 116.9)	85.6 (54.4 – 113.3)
Plagiotriaene II	Rhabdome (µm)	976.3 (924.1 – 1037.1) x 19.9 (16.6 – 23.8)	973.4 (849.5 – 1070.9) x 19.0 (13.5 – 26.0)
	Cladome (µm)	65.5 (51.5 – 84.4)	57.7 (38.1 – 78.3)
	Cladi (µm)	29.8 (18.8 – 38.2)	28.7 (14.9 – 61.4)
Plagiotriaene III	Rhabdome (µm)	608.2 (457.8 – 766.9) x 10.8 (6.1 – 18.4)	564.3 (419.6 – 630.5) x 8.0 (5.7 – 15.2)
	Cladome (µm)	31.8 (19.6 – 53.4)	23.3 (16.3 – 28.4)
	Cladi (µm)	13.9 (8.4 – 24.0)	12.4 (6.7 – 14.9)
	Oxyaster (µm)	10.9 (8.5 – 14.6)	11.8 (9.2 – 14.2)
	Acanthoxyaster I (µm)	18.2 (15.7 – 22.1)	21.3 (17.1 – 27.9)
	Acanthoxyaster II (µm)	19.2 (14.6 – 23.5)	22.5 (15.0 – 27.8)
	Sanidaster (µm)	5.9 (5.2 – 6.8)	5.7 (5.0 – 6.5)

Table 16: Spicule dimensions of four *Penares intermedia* (Dendy, 1905) specimens from this study, n = 10 unless otherwise stated.

	Spicule Type	TS 2300	TS 2307	TS 2445	TS 2447
	Oxea I (µm)	697.8 (603.9 – 758.5) x 16.9 (11.8 – 21.3)	727.3 (637.9 – 806.7) x 17.0 (14.2 – 20.6)	699.6 (613.8 – 925.5) x 18.4 (13.2 – 27.2)	840.4 (703.0 – 999.1) x 27.4 (21.8 – 36.8)
	Oxea II (µm)	359.3 (266.6 – 587.2) x 14.0 (10.4 – 20.8)	354.9 (223.0 – 546.1) x 13.9 (9.3 – 16.7)	311.4 (271.4 – 414.5) x 16.8 (14.7 – 20.2)	408.6 (318.2 – 505.7) x 18.7 (14.9 – 21.9)
	Oxea III (µm)	134.8 (103.4 – 197.2) x 9.3 (6.6 – 13.2)	139.8 (108.1 – 185.7) x 9.1 (6.7 – 11.4)	142.7 (102.9 – 195.4) x 10.8 (8.1 – 13.3)	140.7 (117.9 – 164.3) x 9.8 (7.1 – 12.3)
Dichotriaene I	Rhabdome (µm)	193.2 x 30.0, n = 1	133.5 (49.1 – 200.9) x 29.0 (20.1 – 38.8), n = 6	194.5 x 23.9, n = 1	None seen
	Cladome (µm)	462.3 (460.7 – 463.9), n = 2	457.8 (338.7 – 540.4)	484.8 (422.3 – 528.2), n = 6	487.1 (380.8 – 578.8)
	Protoclad (µm)	103.6 (101.1 – 106.1) x 25.9 (24.5 – 27.2), n = 2	114.5 (97.1 – 139.3) x 30.9 (25.5 – 36.7)	102.3 (91.5 – 119.2) x 36.2 (33.5 – 40.1), n = 6	90.6 (68.4 – 113.3) x 37.8 (27.5 – 48.6)
	Deuteroclad (µm)	144.8 (138.8 – 150.7) x 25.1 (24.6 – 25.6), n = 2	121.9 (88.1 – 151.6) x 25.1 (20.7 – 31.0)	153.2 (119.4 – 196.7) x 29.2 (24.1 – 33.7), n = 6	145.3 (115.9 – 178.2) x 30.2 (20.1 – 38.7)
Dichotriaene II	Rhabdome (µm)	82.3 (74.7 – 89.9) x 25.0 (19.1 – 30.8), n = 2	88.8 (39.6 – 132.8) x 23.4 (13.9 – 31.4), n = 7	66.7 (30.7 – 122.1) x 20.6 (14.4 – 30.0), n = 5	None seen
	Cladome (µm)	341.8 (316.5 – 384.0), n = 6	349.9 (258.5 – 481.0)	329.8 (281.8 – 380.7), n = 7	325.1 (226.3 – 478.4)
	Protoclad (µm)	103.5 (78.3 – 124.8) x 19.6 (15.6 – 27.5), n = 6	119.3 (92.5 – 138.2) x 17.9 (10.4 – 25.6)	94.1 (79.4 – 108.3) x 19.6 (15.2 – 24.6), n = 7	89.0 (74.5 – 102.8) x 21.0 (14.2 – 26.9)
	Deuteroclad (µm)	76.0 (46.7 – 87.2) x 14.8 (10.4 – 18.7), n = 6	65.1 (31.7 – 101.4) x 13.7 (7.5 – 18.9)	80.9 (43.4 – 121.8) x 14.7 (11.9 – 17.8), n = 7	69.0 (28.3 – 122.8) x 15.1 (7.2 – 18.5)
	Microxea (µm)	76.1 (63.1 – 86.6) x 6.6 (5.3 – 8.0)	79.6 (62.7 – 99.1) x 5.8 (5.2 – 6.6)	83.1 (73.8 – 99.0) x 7.4 (5.9 – 9.3)	75.1 (62.6 – 92.1) x 6.0 (5.2 – 7.0)

Table 17: Walters Shoal Seamount sponge species list per location. The symbol (•) denotes all species that are likely new to science. When orange, this symbol denotes the new species found only at that respective location.

Western Flank	**Middle**	**Eastern Flank**
Aaptos sp. •	*Callyspongia (Toxochalina)* cf. *robusta*	*Amorphinopsis* cf. *fistulosa*
Agelas ceylonica	*Tethya* sp. •	Axinellidae sp.
Amorphinopsis (?) sp.		*Axinyssa* cf. *aplysinoides*
Amorphinopsis cf. *fistulosa*		*Brachiaster* (?) sp.
Ancorina sp. •		*Callyspongia (Toxochalina)* cf. *robusta*
Biemna bihamigera		*Callyspongia (Callyspongia)* sp. •
Bubaridae sp.		*Clathria (Clathria)* sp. •
Callyspongia (Toxochalina) cf. *robusta*		Clathrinida sp. 2
Callyspongia (Callyspongia) sp. •		*Desmanthus* sp. •
Chelotropella sp. •		Dictyoceratida sp.
Chondrosia cf. *debilis*		*Dictyodendrilla* cf. *pallasi*
Clathria (Clathria) sp. •		*Eurypon* sp. 1 •
Clathrinida sp. 1		*Eurypon* sp. 2 •
Discodermia panoplia		*Halichondria (Halichondria)* sp. •
Eurypon sp. 1 •		Haplosclerida sp. 2
Fibulia ectofibrosa		Haplosclerida sp. 3
Halichondria (Halichondria) sp. •		Haplosclerida sp. 4
Haplosclerida sp. 1		Haplosclerida sp. 5
Hymedesmia (Hymedesmia) sp. •		Microcionidae sp.
Hymeniacidon sp. •		*Paradesmanthus* sp. •
Hymerhabdia sp. •		*Phakellia* sp. 1 •
Latrunculia (Biannulata) sp. •		*Phakellia* sp. 2 •
Lissodendoryx (Lissodendoryx) pygmaea		Poecilosclerida sp.
Penares intermedia		*Protosuberites* sp. 3 •
Phakellia sp. 1 •		*Ptilocaulis* sp. •
Phakellia sp. 2 •		*Rhabderemia* sp. •

Phakellia sp. 3 • *Phorbas* cf. *frutex* *Poecillastra compressa* *Protosuberites* sp. 1 • *Protosuberites* sp. 2 • *Ptilocaulis* sp. • Raspailiidae sp. *Rhabderemia* sp. • *Spongosorites* sp. • *Stelletta agulhana* *Stelletta purpurea* *Stelletta tulearensis* *Stryphnus progressus* *Tedania (Tedania) sansibarensis* *Tedania (Tedania) tubulifera* *Terpios cruciata* *Tethya* sp. • *Thrombus* sp. • Verongiida sp. *Zyzzya fuliginosa* M1, M2, M3, M5, M6, M7, M10, M11, M13		*Spongosorites* sp. • *Stelletta* cf. *cylindrica* *Stelletta purpurea* *Stelletta tulearensis* *Tethya* sp. • *Timea* cf. *spherastraea* *Vulcanella* sp. • M1, M4, M7, M8, M9, M12
# species: 55 # new species: 21 # new species only found at this location: 11	# species: 2 # new species: 1 # new species only found at this location: 0	# species: 39 # new species: 15 # new species only found at this location: 5

Table 18: SIMPER results – percentage contribution of each species that overall contribute to at least 60% of the difference between the western and eastern flank of Walters Shoal Seamount. Average dissimilarity between the western and eastern flank of the seamount is ~68%.

Species	**% Contribution**
Callyspongia (Callyspongia) sp.	4,7
Clathria (Clathria) sp.	4,62
Callyspongia (Toxochalina) cf. *robusta* (Ridley, 1884)	4,53
Stelletta purpurea Ridley, 1884	3,88
Amorphinopsis cf. *fistulosa* (Vacelet, Vasseur & Lévi, 1976)	3,66
M9	3
Haplosclerida sp. 2	3
Haplosclerida sp. 3	3
M12	3
Tethya sp.	2,69
M7	2,69
Eurypon sp. 1	2,43
Clathrinida sp. 2	2,33
Dictyodendrilla cf. *pallasi* (Ridley, 1884)	2,33
Haplosclerida sp. 4	2,33
Tedania (Tedania) sansibarensis Baer, 1906	2,15
Phakellia sp. 1	2,1
Lissodendoryx (Lissodendoryx) pygmaea (Burton, 1931)	2
Stelletta agulhana Lendenfeld, 1907	2
Fibulia ectofibrosa (Lévi, 1963)	1,66
M1	1,66
Spongosorites sp.	1,63

Table 19: Walters Shoal Seamount sponge species list per depth zone. The symbol (•) denotes all species that are likely new to science. When orange, this symbol denotes the new species found only in that respective depth zone.

Shallow (15 – 30 m)	**Mesophotic (31 – 150 m)**	**Submesophotic (>150 m)**
Aaptos sp. •	*Agelas ceylonica*	*Agelas ceylonica*
Amorphinopsis cf. *fistulosa*	*Amorphinopsis* cf. *fistulosa*	*Amorphinopsis* (?) sp.
Ancorina sp. •	*Biemna bihamigera*	Axinellidae sp.
Callyspongia (Toxochalina) cf. *robusta*	*Callyspongia (Toxochalina)* cf. *robusta*	*Axinyssa* cf. *aplysinoides*
Callyspongia (Callyspongia) sp. •	*Callyspongia (Callyspongia)* sp. •	*Biemna bihamigera*
Clathria (Clathria) sp. •	*Chelotropella* sp. •	*Brachiaster* (?) sp.
Clathrinida sp. 2	*Chondrosia* cf. *debilis*	Bubaridae sp.
Dictyodendrilla cf. *pallasi*	*Clathria (Clathria)* sp. •	*Callyspongia (Toxochalina)* cf. *robusta*
Eurypon sp. 1 •	Clathrinida sp. 1	*Desmanthus* sp. •
Fibulia ectofibrosa	*Fibulia ectofibrosa*	Dictyoceratida sp.
Halichondria (Halichondria) sp. •	*Penares intermedia*	*Discodermia panoplia*
Haplosclerida sp. 1	*Phakellia* sp. 1 •	*Eurypon* sp. 2 •
Haplosclerida sp. 2	*Phorbas* cf. *frutex*	Haplosclerida sp. 5
Haplosclerida sp. 3	*Poecillastra compressa*	*Hymeniacidon* sp. •
Haplosclerida sp. 4	Raspailiidae sp.	*Hymerhabdia* sp. •
Hymedesmia (Hymedesmia) sp. •	*Spongosorites* sp. •	*Latrunculia (Biannulata)* sp. •
Lissodendoryx (Lissodendoryx) pygmaea	*Stelletta purpurea*	Microcionidae sp.
Stelletta agulhana	*Stelletta tulearensis*	*Paradesmanthus* sp. •
Stelletta purpurea	*Tedania (Tedania) tubulifera*	*Penares intermedia*
Tedania (Tedania) sansibarensis	*Tethya* sp. •	*Phakellia* sp. 1 •
Terpios cruciata	Verongiida sp.	*Phakellia* sp. 2 •
Tethya sp. •	M1, M2, M5, M6, M10, M11, M13	*Phakellia* sp. 3 •
M1, M3, M7, M9, M12		*Poecillastra compressa*
		Poecilosclerida sp.
		Protosuberites sp. 1 •
		Protosuberites sp. 2 •

		Protosuberites sp. 3 • *Ptilocaulis* sp. • *Rhabderemia* sp. • *Spongosorites* sp. • *Stelletta* cf. *cylindrica* *Stelletta purpurea* *Stryphnus progressus* *Thrombus* sp. • *Timea* cf. *spherastraea* *Vulcanella* sp. • *Zyzzya fuliginosa* M1, M4, M8
# species: 27 #new species: 8 #new species only found in this depth zone: 5	# species: 28 #new species: 6 #new species only found in this depth zone: 1	#species: 40 #new species: 17 #new species only found in this depth zone: 15

Table 20: SIMPER results – species that contribute to 90% (100% in submesophotic zone) of sampling location similarity in each depth zone (Shallow: 15 – 30 m, Mesophotic: 31 – 150 m, Submesophotic: >150 m). Average sponge faunal similarity of each depth zone is given in brackets.

Species	Shallow (~35%)	Mesophotic (~21%)	Submesophotic (~15%)
Halichondria (Halichondria) sp.	33.81%		
Callyspongia (Callyspongia) sp.	25.97%		
Stelletta purpurea Ridley, 1884	25.97 %		
Clathria (Clathria) sp.	7.84%		
Callyspongia (Toxochalina) cf. *robusta* (Ridley, 1884)		33.33%	
Tethya sp.		33.33%	
M1		33.33%	
Rhabderemia sp.			50.00%
Protosuberites sp. 3			50.00%

Table 21: Walters Shoal Seamount sponges – percent contribution of higher taxonomic levels (families and genera) per depth zone.

Depth Zone	Families	Genera
Shallow (15 – 30 m)	Ancorinidae (17.6%), Callyspongiidae (11.8%), Halichondriidae (11.8%), Suberitidae (11.8%), Coelosphaeridae (5.9%), Dictyodendrillidae (5.9%), Hymedesmiidae (5.9%), Isodictyidae (5.9%), Microcionidae (5.9%), Raspailiidae (5.9%), Tedaniidae (5.9%), Tethyidae (5.9%)	*Callyspongia* (11.8%), *Stelletta* (11.8%), *Aaptos* (5.9%), *Amorphinopsis* (5.9%), *Ancorina* (5.9%), *Clathria* (5.9%), *Dictyodendrilla* (5.9%), *Eurypon* (5.9%), *Fibulia* (5.9%), *Halichondria* (5.9%), *Hymedesmia* (5.9%), *Lissodendoryx* (5.9%), *Tedania* (5.9%), *Terpios* (5.9%), *Tethya* (5.9%)
Mesophotic (31 – 150 m)	Ancorinidae (15.8%), Callyspongiidae (10.5%), Halichondriidae (10.5%), Agelasidae (5.3%), Axinellidae (5.3%), Biemnidae (5.3%), Chondrosiidae (5.3%), Geodiidae (5.3%), Hymedesmiidae (5.3%), Isodictyidae (5.3%), Microcionidae (5.3%), Raspailiidae (5.3%), Tedaniidae (5.3%), Tethyidae (5.3%), Vulcanellidae (5.3%)	*Callyspongia* (11.1%), *Stelletta* (11.1%), *Agelas* (5.6%), *Amorphinopsis* (5.6%), *Biemna* (5.6%), *Chelotropella* (5.6%), *Chondrosia* (5.6%), *Clathria* (5.6%), *Fibulia* (5.6%), *Penares* (5.6%), *Phakellia* (5.6%), *Phorbas* (5.6%), *Poecillastra* (5.6%), *Spongosorites* (5.6%), *Tedania* (5.6%), *Tethya* (5.6%)
Submesophotic (> 150 m)	Axinellidae (14.7%), Halichondriidae (11.8%), Ancorinidae (8.8%), Suberitidae (8.8%), Desmanthidae (5.9%), Vulcanellidae (5.9%), Acarnidae (2.9%), Agelasidae (2.9%), Biemnidae (2.9%), Bubaridae (2.9%), Callyspongiidae (2.9%), Geodiidae (2.9%), Hymerhabdiidae (2.9%), Latrunculiidae (2.9%), Microcionidae (2.9%), Pachastrellidae (2.9%), Raspailiidae (2.9%), Rhabderemiidae (2.9%), Theonellidae (2.9%), Thrombidae (2.9%), Timeidae (2.9%)	*Phakellia* (9.7%), *Protosuberites* (9.7%), *Stelletta* (6.5%), *Agelas* (3.2%), *Amorphinopsis* (3.2%), *Axinyssa* (3.2%), *Biemna* (3.2%), *Brachiaster* (3.2%), *Callyspongia* (3.2%), *Desmanthus* (3.2%), *Discodermia* (3.2%), *Eurypon* (3.2%), *Hymeniacidon* (3.2%), *Hymerhabdia* (3.2%), *Latrunculia* (3.2%), *Paradesmanthus* (3.2%), *Penares* (3.2%), *Poecillastra* (3.2%), *Ptilocaulis* (3.2%), *Rhabderemia* (3.2%), *Spongosorites* (3.2%), *Stryphnus* (3.2%), *Thrombus* (3.2%), *Timea* (3.2%), *Vulcanella* (3.2%), *Zyzzya* (3.2%)

Table 22: Walters Shoal Seamount – sponge families per depth zone (Shallow: 15 – 30 m, Mesophotic: 31 – 150 m, Submesophotic: >150 m), where (X) indicates presence and (–) indicates absence.

Family	Shallow	Mesophotic	Submesophotic
Acarnidae	–	–	X
Agelasidae	–	X	X
Ancorinidae	X	X	X
Axinellidae	–	X	X
Biemnidae	–	X	X
Bubaridae	–	–	X
Callyspongiidae	X	X	X
Chondrosiidae	–	X	–
Coelosphaeridae	X	–	–
Desmanthidae	–	–	X
Dictyodendrillidae	X	–	–
Geodiidae	–	X	X
Halichondriidae	X	X	X
Hymedesmiidae	X	X	–
Hymerhabdiidae	–	–	X
Isodictyidae	X	X	–
Latrunculiidae	–	–	X
Microcionidae	X	X	X
Pachastrellidae	–	–	X
Raspailiidae	X	X	X
Rhabderemiidae	–	–	X
Suberitidae	X	–	X
Tedaniidae	X	X	–
Tethyidae	X	X	–
Theonellidae	–	–	X
Thrombidae	–	–	X
Timeidae	–	–	X
Vulcanellidae	–	X	X

Table 23: Walters Shoal Seamount – sponge genera per depth zone (Shallow: 15 – 30 m, Mesophotic: 31 – 150 m, Submesophotic: >150 m), where (X) indicates presence and (–) indicates absence.

Genus	Shallow	Mesophotic	Submesophotic
Aaptos	X	–	–
Agelas	–	X	X
Amorphinopsis	X	X	X
Ancorina	X	–	–
Axinyssa	–	–	X
Biemna	–	X	X
Brachiaster	–	–	X
Callyspongia	X	X	X
Chelotropella	–	X	–
Chondrosia	–	X	–
Clathria	X	X	–
Desmanthus	–	–	X
Dictyodendrilla	X	–	–
Discodermia	–	–	X
Eurypon	X	–	X
Fibulia	X	X	–
Halichondria	X	–	–
Hymedesmia	X	–	–
Hymeniacidon	–	–	X
Hymerhabdia	–	–	X
Latrunculia	–	–	X
Lissodendoryx	X	–	–
Paradesmanthus	–	–	X
Penares	–	X	X
Phakellia	–	X	X
Phorbas	–	X	–
Poecillastra	–	X	X
Protosuberites	–	–	X
Ptilocaulis	–	–	X
Rhabderemia	–	–	X
Spongosorites	–	X	X
Stelletta	X	X	X
Stryphnus	–	–	X
Tedania	X	X	–
Terpios	X	–	–
Tethya	X	X	–
Thrombus	–	–	X
Timea	–	–	X
Vulcanella	–	–	X
Zyzzya	–	–	X

Table 24: SIMPER results – percentage contribution (bold) of each species that overall contribute to at least 60% of the difference between depth zones (Shallow: 15 – 30 m, Mesophotic: 31 – 150 m, Submesophotic: >150 m). Average dissimilarities between depth zones given in brackets.

Shallow & Mesophotic (~79%)	**Mesophotic & Submesophotic** (~83%)	**Shallow & Submesophotic** (~97%)
Halichondria (Halichondria) sp. **7,26**	*Rhabderemia* sp. **4,91**	*Halichondria (Halichondria)* sp. **4,26**
Callyspongia (Callyspongia) sp. **6,38**	*Tethya* sp. **4,91**	*Rhabderemia* sp. **4,26**
M1 **6,11**	*Stelletta tulearensis* **3,75**	*Clathria (Clathria)* sp. **3,15**
Callyspongia (Toxochalina) cf. *robusta* **4,98**	*Ptilocaulis* sp. **3,6**	*Phakellia* sp. 1 **3,07**
Amorphinopsis cf. *fistulosa* **4,3**	*Callyspongia (Toxochalina)* cf. *robusta* **3,14**	*Ptilocaulis* sp. **3,07**
Clathria (Clathria) sp. **3,84**	*Phakellia* sp. 1 **3,14**	*Stelletta purpurea* **2,85**
Spongosorites sp. **3,48**	*Phakellia* sp. 2 **3,14**	*Callyspongia (Callyspongia)* sp. **2,75**
Stelletta tulearensis **3,48**	*Callyspongia (Callyspongia)* sp. **3,08**	*Protosuberites* sp. 3 **2,75**
Tethya sp. **3,26**	*Protosuberites* sp. 3 **3,08**	*Phakellia* sp. 2 **2,69**
M7 **3,26**	*Stelletta purpurea* **2,93**	M1 **2,3**
Stelletta purpurea **2,6**	*Spongosorites* sp. **2,44**	*Tethya* sp. **2,19**
Tedania (Tedania) sansibarensis **2,13**	Bubaridae sp. **1,83**	M7 **2,07**
Eurypon sp. 1 **2,03**	*Discodermia panoplia* **1,83**	*Callyspongia (Toxochalina)* cf. *robusta* **1,74**
Phakellia sp. 1 **2,01**	*Hymeniacidon* sp. **1,83**	*Amorphinopsis* cf. *fistulosa* **1,64**
Lissodendoryx (Lissodendoryx) pygmaea **1,97**	*Hymerhabdia* sp. **1,83**	*Eurypon* sp. 1 **1,64**
Stelletta agulhana **1,97**	*Latrunculia (Biannulata)* sp. **1,83**	*Brachiaster* (?) sp. **1,57**
Fibulia ectofibrosa **1,83**	*Phakellia* sp. 3 **1,83**	*Eurypon* sp. 2 **1,57**
	Protosuberites sp. 1 **1,83**	*Paradesmanthus* sp. **1,57**
	Protosuberites sp. 2 **1,83**	*Vulcanella* sp. **1,57**
	Stryphnus progressus **1,83**	M8 **1,57**
	Thrombus sp. **1,83**	Axinellidae sp. **1,57**
	Zyzzya fuliginosa **1,83**	*Agelas ceylonica* **1,51**

	Amorphinopsis (?) sp. **1,83**	*Biemna bihamigera* **1,51** Bubaridae sp. **1,51** *Discodermia panoplia* **1,51** *Hymeniacidon* sp. **1,51** *Hymerhabdia* sp. **1,51** *Latrunculia (Biannulata)* sp. **1,51**

Table 25: Biogeographical affinities of the Walters Shoal Seamount sponge fauna based on the 23 known species from this study. Categorisation follows Spalding *et al*. (2007). Abbreviations: IO = Indian Ocean, WIO = Western Indian Ocean, SA = South Africa, NMCC = Northern Monsoon Current Coast, EACC = East African Coral Coast, SEY = Seychelles, CCTI = Cargados Carajos/Tromelin Island, MAS = Mascarene Islands, WANM = Western and Northern Madagascar, DEL = Delagoa, NAM = Namaqua, AGU = Agulhas Bank and NAT = Natal. The symbol (X) indicates presence, while (–) indicates absence.

		Western Indo-Pacific Realm							**Temperate Southern Africa Realm**		
		Western Indian Ocean Province							*Benguela Province*	*Agulhas Province*	
Species	**Affinity**	**NMCC**	**EACC**	**SEY**	**CCTI**	**MAS**	**WANM**	**DEL**	**NAM**	**AGU**	**NAT**
Agelas ceylonica Dendy, 1905	IO	–	–	X	–	–	–	–	–	–	–
Amorphinopsis fistulosa (Vacelet, Vasseur & Lévi,	WIO	–	–	–	–	–	X	–	–	–	–
Axinyssa aplysinoides (Dendy, 1922)	WIO	–	X	X	X	–	X	–	–	–	–
Biemna bihamigera (Dendy, 1922)	IO	–	X	X	–	–	X	–	–	–	–
Callyspongia (Toxochalina) robusta (Ridley, 1884)	IO	–	X	–	–	–	X	–	–	–	X
Chondrosia debilis Thiele, 1900	IO	–	–	–	–	–	X	–	–	–	–
Dictyodendrilla pallasi (Ridley, 1884)	WIO	–	–	X	–	–	–	–	–	–	–
Discodermia panoplia Sollas, 1888	IO	–	–	–	–	–	X	–	–	–	–
Fibulia ectofibrosa (Lévi, 1963)	SA	–	–	–	–	–	–	–	X	X	–
Lissodendoryx (Lissodendoryx) pygmaea (Burton, 1931)	SA	–	–	–	–	–	–	–	–	–	X
Penares intermedia (Dendy, 1905)	IO	X	X	–	–	–	–	–	–	–	–
Phorbas frutex Pulitzer–Finali, 1993	WIO	–	X	–	–	–	–	–	–	–	–
Poecillastra compressa (Bowerbank, 1866)	SA	–	–	–	–	–	–	–	X	–	–
Stelletta agulhana Lendenfeld, 1907	SA	–	–	–	–	–	–	–	X	X	X
Stelletta cylindrica Thomas, 1973	WIO	–	–	X	–	–	–	–	–	–	–
Stelletta purpurea Ridley, 1884	IO	X	X	X	–	X	–	X	–	–	X
Stelletta tulearensis Vacelet, Vasseur & Lévi, 1976	WIO	–	X	–	–	–	X	–	–	–	–
Stryphnus progressus (Lendenfeld, 1907)	SA	–	–	–	–	–	–	–	–	X	–
Tedania (Tedania) sansibarensis Baer, 1906	WIO	–	X	–	–	–	–	–	–	–	–
Tedania (Tedania) tubulifera Lévi, 1963	SA	–	–	–	–	–	–	–	X	X	–
Terpios cruciata (Dendy, 1905)	IO	–	–	X	–	–	–	X	–	–	–
Timea spherastraea Burton, 1959	WIO	–	X	–	–	–	–	–	–	–	–
Zyzzya fuliginosa (Carter, 1879)	IO	–	X	X	–	–	X	–	–	–	–
Similarity (shared species)											
Absolute number		2	10	8	1	1	8	2	4	4	4
Percentage (%)		2,6	12,8	10,3	1,3	1,3	10,3	2,6	5,1	5,1	5,1

Table 26: The most represented sponge families and genera per ecoregion that was found to have biogeographical affiliations with Walters Shoal Seamount. Categorisation follows Spalding *et al*. (2007), with numbers in brackets indicating the number of sponge species recorded in each ecoregion, compiled from the World Porifera Database (van Soest *et al*. 2015). Ecoregion 101 was excluded as it had only one sponge species recorded. Last updated May 2015.

Western Indo-Pacific Realm			
20. *Western Indian Ocean Province*		**Families**	**Genera**
94.	Northern Monsoon Current Coast Ecoregion (44)	Ancorinidae (13.6%), Phloeodictyidae (11.4%), Raspailiidae (11.4%)	*Hemiasterella* (6.8%), *Higginsia* (6.8%), *Oceanapia* (6.8%), *Xestospongia* (6.8%)
95.	East African Coral Coast Ecoregion (172)	Chalinidae (8.1%), Halichondriidae (7.0%), Ancorinidae (4.7%), Axinellidae (4.7%), Callyspongiidae (4.7%)	*Haliclona* (7.6%), *Callyspongia* (4.7%), *Biemna* (3.5%), *Mycale* (3.5%)
96.	Seychelles Ecoregion (147)	Ancorinidae (8.2%), Acarnidae (5.4%), Halichondriidae (4.8%), Microcionidae (4.8%)	*Clathria* (4.8%), *Biemna* (3.4%), *Rhabdastrella* (3.4%), *Tethya* (3.4%)
97.	Cargados Carajos/Tromelin Island Ecoregion (27)	Axinellidae (11.1%), Microcionidae (11.1%)	*Clathria* (11.1%), *Dragmacidon* (7.4%)
98.	Mascarene Islands Ecoregion (35)	Raspailiidae (11.4%), Spongiidae (11.4%), Grantiidae (8.6%)	*Leucandra* (8.6%), *Dysidea* (5.7%), *Spongia* (5.7%), *Stelletta* (5.7%)
99.	Southeast Madagascar Ecoregion (4)	Geodiidae (75.0%), Spongiidae (25.0%)	*Geodia* (75.0%), *Spongia* (25.0%)
100.	Western and Northern Madagascar Ecoregion (150)	Chalinidae (6.0%), Microcionidae (5.3%), Ancorinidae (4.7%), Mycalidae (4.7%)	*Haliclona* (6.0%), *Clathria* (5.3%), *Mycale* (4.7%)
101.	Bight of Sofala/Swamp Coast Ecoregion (1)	**Excluded**	
102.	Delagoa Ecoregion (34)	Ancorinidae (17.6%), Axinellidae (11.8%), Microcionidae (11.8)	*Clathria* (8.8%), *Stelletta* (8.8%)
Temperate Southern Africa Realm			
50. *Benguela Province*			
190.	Namib Ecoregion	**Excluded**	
191.	Namaqua Ecoregion (138)	Microcionidae (15.2%), Mycalidae (8.7%)	*Clathria* (12.3%), *Mycale* (8.7%), *Haliclona* (5.8%), *Isodictya* (5.8%)
51. *Agulhas Province*			
192.	Agulhas Bank Ecoregion (131)	Geodiidae (7.6%), Grantiidae (7.6%), Latrunculiidae (6.9%)	*Clathria* (5.3%), *Isodictya* (5.3%), *Leucandra* (5.3%)
193.	Natal Ecoregion	Ancorinidae (13.9%),	*Clathria* (8.9%),

	(101)	Geodiidae (9.9%), Microcionidae (8.9%)	*Geodia* (6.9%), *Stelletta* (6.9%)
Other			
Walters Shoal Seamount		Ancorinidae (12.7%), Halichondriidae (10.9%), Axinellidae (9.1%), Suberitidae (9.1%)	*Stelletta* (7.8%), *Phakellia* (5.9%), *Protosuberites* (5.9%)

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Table A: Taxonomic sponge species list per ecoregion included in the biogeographical analyses, compiled from the World Porifera Database (van Soest *et al*. 2015). Categorisation follows Spalding *et al*. (2007), with numbers in the brackets indicating the number of species recorded per ecoregion. Ecoregions 101 (Bight of Sofala/Swamp Coast) and 217 (Bouvet Island) were excluded as they had one and zero species recorded respectively. Vema Seamount is also included for comparison as an associate of the West Wind Drift Islands Province. Last updated May 2015.

Western Indo-Pacific Realm

20. *Western Indian Ocean Province*

94. Northern Monsoon Current Coast Ecoregion (44)

Aciculites tulearensis **Vacelet & Vasseur, 1965**; *Amphimedon rubida* **Pulitzer-Finali, 1993**; *Aulospongus flabellum* **Pulitzer-Finali, 1993**; *Aulospongus involutus* **(Kirkpatrick, 1903)**; *Axinella arborescens* **Ridley & Dendy, 1886**; *Axinella donnani* **(Bowerbank, 1873)**; *Axinyssa tenax* **Pulitzer-Finali, 1993**; *Callipelta thoosa* **Lévi, 1964**; *Callyspongia subtilis* **Pulitzer-Finali, 1993**; *Calyx infundibulum* **Pulitzer-Finali, 1993**; *Chelotropella sphaerica* **Lendenfeld, 1907**; *Chondrocladia (Chondrocladia) multichela* **Lévi, 1964**; *Coelosphaera (Coelosphaera) crumena* **Pulitzer-Finali, 1993**; *Crambe erecta* **Pulitzer-Finali, 1993**; *Crella (Grayella) cyathophora* **Carter, 1869**; *Echinodictyum jousseaumi* **Topsent, 1892**; *Ecionemia acervus* **Bowerbank, 1864**; *Erylus globulifer* **Pulitzer-Finali, 1993**; *Hemiasterella complicata* **Topsent, 1919**; *Hemiasterella intermedia* **Dendy, 1922**; *Hemiasterella magna* **Pulitzer-Finali, 1993**; *Higginsia kenyensis* **Pulitzer-Finali, 1993**; *Higginsia lamella* **Pulitzer-Finali, 1993**; *Higginsia pulcherrima* **Pulitzer-Finali, 1993**; *Jaspis manihinei* **Pulitzer-Finali, 1993**; *Lithoplocamia indica* **Pulitzer-Finali, 1993**; *Lithoplocamia tuberculata* **Pulitzer-Finali, 1993**; *Manihinea conferta* **Pulitzer-Finali, 1993**; *Oceanapia exigua* **Pulitzer-Finali, 1993**; *Oceanapia fistulosa* **(Bowerbank, 1873)**; *Oceanapia globosa* **Pulitzer-Finali, 1993**; *Penares intermedia* **(Dendy, 1905)**; *Petrosia (Petrosia) nigricans* **Lindgren, 1897**; *Phorbas palmatus* **Pulitzer-Finali, 1993**; *Spheciospongia inconstans* **(Dendy, 1887)**; *Stelletta digitata* **(Pulitzer-Finali, 1993)**; *Stelletta purpurea* **Ridley, 1884**; *Tabulocalyx pedunculatus* **Pulitzer-Finali, 1993**; *Tethyopsis plurima* **(Pulitzer-Finali, 1993)**; *Thenea tyla* **Lendenfeld, 1907**; *Theonella swinhoei* **Gray, 1868**; *Xestospongia clavata* **Pulitzer-Finali, 1993**; *Xestospongia informis* **Pulitzer-Finali, 1993**; *Xestospongia tuberosa* **Pulitzer-Finali, 1993**

95. East African Coral Coast Ecoregion (172)

Acanthostylotella cornuta **(Topsent, 1897)**; *Acarnus ternatus* **Ridley, 1884**; *Amorphinopsis foetida* **(Dendy, 1889)**; *Amphimedon navalis* **Pulitzer-Finali, 1993**; *Amphimedon rubiginosa* **Pulitzer-Finali, 1993**; *Amphimedon spinosa* **Pulitzer-Finali, 1993**; *Aplysina primitiva* **Burton, 1959**; *Astrosclera willeyana* **Lister, 1900**; *Aulospongus involutus* **(Kirkpatrick, 1903)**; *Axinella aruensis* **(Hentschel, 1912)**; *Axinella flabelloreticulata* **Burton, 1959**; *Axinella massalis* **Burton, 1959**; *Axinella ventilabrum* **Burton, 1959**; *Axinella weltnerii*

(Lendenfeld, 1897); *Axinyssa aplysinoides* **(Dendy, 1922)**; *Axinyssa topsenti* **Lendenfeld, 1897**; *Biemna bihamigera* **(Dendy, 1922)**; *Biemna fistulosa* **(Topsent, 1897)**; *Biemna fortis* **(Topsent, 1897)**; *Biemna humilis* **Thiele, 1903**; *Biemna microstrongyla* **(Hentschel, 1912)**; *Biemna trirhaphis* **(Topsent, 1897)**; *Bubaris conulosa* **Vacelet & Vasseur, 1971**; *Callyspongia (Cladochalina) diffusa* **(Ridley, 1884)**; *Callyspongia (Toxochalina) robusta* **(Ridley, 1884)**; *Callyspongia abnormis* **Pulitzer-Finali, 1993**; *Callyspongia contorta* **Pulitzer-Finali, 1993**; *Callyspongia hirta* **Pulitzer-Finali, 1993**; *Callyspongia perforata* **Pulitzer-Finali, 1993**; *Callyspongia reticulata* **(Keller, 1889)**; *Callyspongia violacea* **Pulitzer-Finali, 1993**; *Calyx nyaliensis* **Pulitzer-Finali, 1993**; *Carteriospongia foliascens* **(Pallas, 1766)**; *Chondrilla mixta* **Schulze, 1877**; *Chondrilla sacciformis* **Carter, 1879**; *Cinachyrella arabica* **(Carter, 1869)**; *Cinachyrella lacerata* **(Bösraug, 1913)**; *Ciocalypta digitata* **(Dendy, 1905)**; *Cladocroce tubulosa* **Pulitzer-Finali, 1993**; *Clathria (Microciona) affinis* **(Carter, 1880)**; *Clathria (Microciona) anonyma* **(Burton, 1959)**; *Clathria (Microciona) richmondi* **Hooper, Kelly & Kennedy, 2000**; *Coelosphaera (Coelosphaera) navicelligera* **(Ridley, 1885)**; *Crella shimonii* **Pulitzer-Finali, 1993**; *Diplastrella gardineri* **Topsent, 1918**; *Discodermia discifera* **(Lendenfeld, 1907)**; *Dragmacidon coccineum* **(Keller, 1891)**; *Dragmacidon durissimum* **(Dendy, 1905)**; *Ecionemia acervus* **Bowerbank, 1864**; *Epipolasis suluensis* **(Wilson, 1925)**; *Erylus lendenfeldi* **Sollas, 1888**; *Fangophilina hirsuta* **Lendenfeld, 1907**; *Fascaplysinopsis reticulata* **(Hentschel, 1912)**; *Fasciospongia friabilis* **(Hyatt, 1877)**; *Fasciospongia operculum* **(Lendenfeld, 1897)**; *Geodia carcinophila* **(Lendenfeld, 1897)**; *Geodia crustosa* **Bösraug, 1913**; *Geodia pleiades* **(Sollas, 1888)**; *Geodia sollasi* **(Lendenfeld, 1888)**; *Geodia spheranthastra* **Pulitzer-Finali, 1993**; *Halichondria (Halichondria) cartilaginea* **(Esper, 1794)**; *Halichondria (Halichondria) lendenfeldi* **Lévi, 1961**; *Halichondria (Halichondria) tenuiramosa* **Dendy, 1922**; *Haliclona (Gellius) amboinensis* **(Lévi, 1961)**; *Haliclona (Gellius) cellaria* **(Rao, 1941)**; *Haliclona (Gellius) toxia* **(Topsent, 1897)**; *Haliclona (Reniera) debilis* **Pulitzer-Finali, 1993**; *Haliclona bawiana* **(Lendenfeld, 1897)**; *Haliclona cavernosa* **(Pulitzer-Finali, 1993)**; *Haliclona cerebrum* **(Burton, 1928)**; *Haliclona decidua* **(Topsent, 1906)**; *Haliclona digitata* **(Baer, 1906)**; *Haliclona fistulosa* **(Pulitzer-Finali, 1993)**; *Haliclona irregularis* **(Kirkpatrick, 1900)**; *Haliclona mollis* **(Baer, 1906)**; *Haliclona pigmentifera* **(Dendy, 1905)**; *Halisarca ferreus* **Bergquist & Kelly, 2004**; *Hemiasterella bouilloni* **(Thomas, 1973)**; *Hyalonema (Cyliconema) molle* **Schulze, 1904**; *Hyalonema (Prionema) validum* **Schulze, 1904**; *Hyattella intestinalis* **(Lamarck, 1814)**; *Hymedesmia (Hymedesmia) murrayi* **Burton, 1959**; *Iotrochota baculifera* **Ridley, 1884**; *Iotrochota nigra* **(Baer, 1906)**; *Iotrochota purpurea* **(Bowerbank, 1875)**; *Jaspis sansibarensis* **(Baer, 1906)**; *Lamellodysidea herbacea* **(Keller, 1889)**; *Lendenfeldia plicata* **(Esper, 1794)**; *Leucandra brumalis* **Jenkin, 1908**; *Leucandrilla wasinensis* **(Jenkin, 1908)**; *Liosina paradoxa* **Thiele, 1899**; *Lissodendoryx (Lissodendoryx) monticularis* **Baer, 1906**; *Lissodendoryx (Waldoschmittia) schmidti* **(Ridley, 1884)**; *Lithoplocamia minor* **Pulitzer-Finali, 1993**; *Monorhaphis chuni* **Schulze, 1904**; *Mycale (Aegogropila) crassissima* **(Dendy, 1905)**; *Mycale (Aegogropila) sulevoidea* **(Sollas, 1902)**; *Mycale (Mycale) grandis* **Gray, 1867**; *Mycale (Zygomycale) parishii* **(Bowerbank, 1875)**; *Mycale imperfecta* **Baer, 1906**; *Mycale multisclera* **Pulitzer-Finali, 1993**; *Myrmekioderma granulatum* **(Esper, 1794)**; *Negombata kenyensis* **(Pulitzer-Finali, 1993)**; *Negombo kellyae* **Hooper, 2002**; *Neopetrosia contignata* **(Thiele, 1899)**; *Neopetrosia exigua* **(Kirkpatrick, 1900)**; *Oceanapia cagayanensis* **(Wilson, 1925)**; *Oceanapia media* **(Thiele, 1899)**; *Oceanapia minuta* **(Vacelet, Vasseur & Lévi, 1976)**; *Oceanapia polysiphonia* **(Dendy, 1922)**; *Oceanapia zoologica* **(Dendy, 1905)**; *Oscarella nigraviolacea* **Bergquist & Kelly, 2004**; *Paratetilla bacca* **(Selenka, 1867)**; *Penares intermedia* **(Dendy, 1905)**; *Petrosia (Petrosia) expansa* **(Thiele, 1903)**; *Petrosia (Petrosia) seychellensis* **Dendy, 1922**; *Petrosia (Petrosia) shellyi* **Pulitzer-Finali, 1993**; *Petrosia (Strongylophora) mauritiana* **(Carter, 1885)**; *Phakellia radiata* **(Dendy, 1916)**; *Phakettia ridleyi* **(Dendy, 1887)**; *Phorbas frutex* **Pulitzer-Finali, 1993**; *Phyllospongia lamellosa* **(Esper, 1794)**; *Placospongia carinata* **(Bowerbank, 1858)**; *Placospongia melobesioides* **Gray, 1867**; *Plakinastrella ceylonica* **(Dendy, 1905)**; *Plakortis copiosa* **Pulitzer-Finali, 1993**; *Plakortis kenyensis* **Pulitzer-Finali, 1993**; *Plakortis nigra* **Lévi, 1953**; *Platylistrum platessa* **Schulze, 1904**; *Polymastia*

	megasclera **Burton, 1934**; *Raspailia colorans* **Pulitzer-Finali, 1993**; *Rhabdastrella globostellata* **(Carter, 1883)**; *Soleneiscus irregularis* **(Jenkin, 1908)**; *Spheciospongia excentrica* **(Burton, 1931)**; *Spheciospongia florida* **(Lendenfeld, 1897)**; *Spheciospongia inconstans* **(Dendy, 1887)**; *Spheciospongia vagabunda* **(Ridley, 1884)**; *Spongia (Spongia) cookii* **Hyatt, 1877**; *Spongia (Spongia) hospes* **(Lendenfeld, 1889)**; *Spongia (Spongia) mollicula* **Hyatt, 1877**; *Spongosorites topsenti* **Dendy, 1905**; *Stelletta brevioxea* **Pulitzer-Finali, 1993**; *Stelletta herdmani* **Dendy, 1905**; *Stelletta purpurea* **Ridley, 1884**; *Stelletta tulearensis* **Vacelet, Vasseur & Lévi, 1976**; *Stellettinopsis laviniensis* **(Dendy, 1905)**; *Strongylacidon fasciculatum* **Pulitzer-Finali, 1993**; *Strongylacidon sansibarense* **Lendenfeld, 1897**; *Sycettusa simplex* **(Jenkin, 1908)**; *Sycon munitum* **Jenkin, 1908**; *Tedania (Tedania) conica* **Baer, 1906**; *Tedania (Tedania) fragilis* **Baer, 1906**; *Tedania (Tedania) sansibarensis* **Baer, 1906**; *Tedania (Tedania) vulcani* **Lendenfeld, 1897**; *Tethya globostellata* **Lendenfeld, 1897**; *Tethya parvistella* **(Baer, 1906)**; *Tethya seychellensis* **(Wright, 1881)**; *Tetilla globosa* **(Baer, 1906)**; *Tetilla sansibarica* **(Lendenfeld, 1907)**; *Tetrapocillon minor* **Pulitzer-Finali, 1993**; *Thenea malindiae* **Lendenfeld, 1907**; *Thenea pendula* **Lendenfeld, 1907**; *Thenea rotunda* **Lendenfeld, 1907**; *Theonella conica* **(Kieschnick, 1896)**; *Theonella swinhoei* **Gray, 1868**; *Timea spherastraea* **Burton, 1959**; *Timea tethyoides* **Burton, 1959**; *Topsentia halichondrioides* **(Dendy, 1905)**; *Topsentia megalorrhapis* **(Carter, 1881)**; *Topsentia salomonensis* **(Dendy, 1922)**; *Xestospongia testudinaria* **(Lamarck, 1815)**; *Zyzzya fuliginosa* **(Carter, 1879)**
96.	Seychelles Ecoregion (147) *Acanthella cavernosa* **Dendy, 1922**; *Acanthostylotella cornuta* **(Topsent, 1897)**; *Acanthotetilla seychellensis* **(Thomas, 1973)**; *Acarnus bicladotylotus* **Hoshino, 1981**; *Acarnus ternatus* **Ridley, 1884**; *Acarnus topsenti* **Dendy, 1922**; *Agelas ceylonica* **Dendy, 1905**; *Astrosclera willeyana* **Lister, 1900**; *Aulospongus gardineri* **(Dendy, 1922)**; *Axinella donnani* **(Bowerbank, 1873)**; *Axinella minor* **Thomas, 1981**; *Axinella proliferans* **Ridley, 1884**; *Axinyssa aplysinoides* **(Dendy, 1922)**; *Biemna bihamigera* **(Dendy, 1922)**; *Biemna fortis* **(Topsent, 1897)**; *Biemna seychellensis* **Thomas, 1973**; *Biemna trirhaphis* **(Topsent, 1897)**; *Biemna tubulata* **(Dendy, 1905)**; *Callyspongia (Callyspongia) differentiata* **(Dendy, 1922)**; *Callyspongia (Callyspongia) reticutis* **(Dendy, 1905)**; *Carteriospongia foliascens* **(Pallas, 1766)**; *Chalinula camerata* **(Ridley, 1884)**; *Chalinula confusa* **(Dendy, 1922)**; *Chondrilla australiensis* **Carter, 1873**; *Chondrocladia (Chondrocladia) clavata* **Ridley & Dendy, 1886**; *Cinachyrella australiensis* **(Carter, 1886)**; *Clathria (Clathria) decumbens* **Ridley, 1884**; *Clathria (Clathria) maeandrina* **Ridley, 1884**; *Clathria (Clathria) spongodes* **Dendy, 1922**; *Clathria (Thalysias) amirantiensis* **Hooper, 1996**; *Clathria (Thalysias) procera* **(Ridley, 1884)**; *Clathria (Thalysias) robusta* **(Dendy, 1922)**; *Clathria (Thalysias) vulpina* **(Lamarck, 1814)**; *Coelosphaera (Coelosphaera) ramosa* **(Dendy, 1922)**; *Cornulella amirantensis* **van Soest, Zea & Kielman, 1994**; *Cornulella lundbecki* **Dendy, 1922**; *Cornulella tyro* **van Soest, Zea & Kielman, 1994**; *Crambe acuata* **(Lévi, 1958)**; *Crella (Grayella) cyathophora* **Carter, 1869**; *Cyamon vickersii* **(Bowerbank, 1864)**; *Damiria toxifera* **van Soest, Zea & Kielman, 1994**; *Dictyodendrilla pallasi* **(Ridley, 1884)**; *Didiscus aceratus* **(Ridley & Dendy, 1886)**; *Discodermia laevidiscus* **Carter, 1880**; *Dragmacidon durissimum* **(Dendy, 1905)**; *Dragmacidon durissimum var. massale* **(Dendy, 1922)**; *Dysidea gumminea* **Ridley, 1884**; *Ecionemia acervus* **Bowerbank, 1864**; *Erylus cylindriger* **Ridley, 1884**; *Erylus lendenfeldi* **Sollas, 1888**; *Euplectella cucumer* **Owen, 1857**; *Eurypon encrusta* **(Thomas, 1981)**; *Fasciospongia seychellensis* **(Thomas, 1973)**; *Forcepia (Forcepia) stephensi* **Dendy, 1922**; *Geodia auroristella* **Dendy, 1916**; *Geodia lindgreni* **(Lendenfeld, 1903)**; *Geodia micraster* **(Lendenfeld, 1907)**; *Halichondria (Halichondria) aldabrensis* **Lévi, 1961**; *Halichondria (Halichondria) lendenfeldi* **Lévi, 1961**; *Haliclona (Haliclona) cribriformis* **(Ridley, 1884)**; *Haliclona (Reniera) cribricutis* **(Dendy, 1922)**; *Haliclona (Reniera) tufoides* **(Dendy, 1922)**; *Hemiasterella bouilloni* **(Thomas, 1973)**; *Hemiasterella intermedia* **Dendy, 1922**; *Higginsia fragilis* **Lévi, 1961**; *Higginsia higgini* **Dendy, 1922**;

Higginsia petrosioides **Dendy, 1922**; *Hyalonema (Cyliconema) madagascarense* **(Lévi, 1964)**; *Hyattella sinuosa* **(Pallas, 1766)**; *Hymedesmia (Hymedesmia) prostrata* **Thiele, 1903**; *Hymeniacidon proteus* **(Ridley, 1884)**; *Hymeniacidon variospiculata* **Dendy, 1922**; *Hyrtios erectus* **(Keller, 1889)**; *Igernella mirabilis* **Lévi, 1961**; *Iotrochota baculifera* **Ridley, 1884**; *Iotrochota purpurea* **(Bowerbank, 1875)**; *Jaspis penetrans* **(Carter, 1880)**; *Leucaltis nodusgordii* **(Poléjaeff, 1883)**; *Leucandra anguinea* **(Ridley, 1884)**; *Leucandra seychellensis* **Hozawa, 1940**; *Leucetta chagosensis* **Dendy, 1913**; *Levinella prolifera* **(Dendy, 1913)**; *Liosina paradoxa* **Thiele, 1899**; *Lithoplocamia lithistoides* **Dendy, 1922**; *Microscleroderma herdmani* **(Dendy, 1905)**; *Monanchora unguiculata* **(Dendy, 1922)**; *Mycale (Aegogropila) crassissima* **(Dendy, 1905)**; *Mycale (Grapelia) vansoesti* **Hajdu, 1995**; *Mycale (Mycale) gelatinosa* **(Ridley, 1884)**; *Myrmekioderma granulatum* **(Esper, 1794)**; *Myxilla (Myxilla) seychellensis* **Thomas, 1981**; *Neopetrosia retiderma* **(Dendy, 1922)**; *Oceanapia fistulosa* **(Bowerbank, 1873)**; *Oceanapia pellucida* **(Ridley, 1884)**; *Oceanapia seychellensis* **(Dendy, 1922)**; *Oceanapia toxophila* **Dendy, 1922**; *Paraleucilla proteus* **(Dendy, 1913)**; *Pericharax orientalis* **Van Soest & De Voogd, 2015**; *Petrosia (Petrosia) nigricans* **Lindgren, 1897**; *Petrosia (Strongylophora) durissima* **(Dendy, 1905)**; *Phakellia radiata* **(Dendy, 1916)**; *Phlyctaenopora (Barbozia) primitiva* **(Dendy, 1922)**; *Phorbas clathrodes* **(Dendy, 1922)**; *Phorbas papillatus* **(Dendy, 1922)**; *Phyllospongia alcicornis* **(Esper, 1794)**; *Phyllospongia supraoculata* **Ridley, 1884**; *Plakinastrella minor* **(Dendy, 1916)**; *Rhabdastrella cribriporosa* **(Dendy, 1916)**; *Rhabdastrella globostellata* **(Carter, 1883)**; *Rhabdastrella oxytoxa* **(Thomas, 1973)**; *Rhabdastrella providentiae* **(Dendy, 1916)**; *Rhabdastrella rowi* **(Dendy, 1916)**; *Rhabderemia bistylifera* **Lévi, 1961**; *Siphonodictyon minutum* **(Thomas, 1973)**; *Spheciospongia globularis* **(Dendy, 1922)**; *Spheciospongia inconstans* **(Dendy, 1887)**; *Spheciospongia inconstans var. digitata* **(Dendy, 1887)**; *Spheciospongia transitoria* **(Ridley, 1884)**; *Spirastrella decumbens* **Ridley, 1884**; *Spirastrella pachyspira* **Lévi, 1958**; *Spongionella retiara* **(Dendy, 1916)**; *Spongosorites niger* **(Dendy, 1922)**; *Stelletta cylindrica* **Thomas, 1973**; *Stelletta jonesi* **(Thomas, 1973)**; *Stelletta purpurea* **Ridley, 1884**; *Stellettinopsis cherbonnieri* **Lévi, 1961**; *Stellettinopsis laviniensis* **(Dendy, 1905)**; *Strongylamma wilsoni* **(Dendy, 1922)**; *Stylissa carteri* **(Dendy, 1889)**; *Stylissa conulosa* **(Dendy, 1922)**; *Stylissa massa* **(Carter, 1887)**; *Terpios cruciata* **(Dendy, 1905)**; *Tethya japonica* **Sollas, 1888**; *Tethya peracuta* **(Topsent, 1918)**; *Tethya robusta* **(Bowerbank, 1873)**; *Tethya seychellensis* **(Wright, 1881)**; *Tethya stellagrandis* **(Dendy, 1916)**; *Theonella complicata* **(Carter, 1880)**; *Theonella conica* **(Kieschnick, 1896)**; *Theonella swinhoei* **Gray, 1868**; *Thoosa radiata* **Topsent, 1887**; *Thrombus ornatus* **Sollas, 1888**; *Timea anthastra* **Lévi, 1961**; *Timea curvistellifera* **(Dendy, 1905)**; *Topsentia stellettoides* **(Lévi, 1961)**; *Xestospongia testudinaria* **(Lamarck, 1815)**; *Zyzzya fuliginosa* **(Carter, 1879)**

97. Cargados Carajos/Tromelin Island Ecoregion (27)

Acanthella calyx **(Dendy, 1922)**; *Acarnus topsenti* **Dendy, 1922**; *Auletta lyrata var. brevispiculata* **Dendy, 1905**; *Aulocalyx serialis* **Dendy, 1916**; *Axinyssa aplysinoides* **(Dendy, 1922)**; *Clathria (Clathria) whiteleggii* **Dendy, 1922**; *Clathria (Thalysias) lendenfeldi* **Ridley & Dendy, 1886**; *Clathria (Thalysias) procera* **(Ridley, 1884)**; *Dictyonella conglomerata* **(Dendy, 1922)**; *Didiscus placospongioides* **Dendy, 1922**; *Discodermia tuberosa* **Dendy, 1922**; *Dragmacidon durissimum var. erectum* **(Dendy, 1922)**; *Dragmacidon durissimum var. tethyoides* **(Dendy, 1922)**; *Erylus proximus* **Dendy, 1916**; *Grantia indica* **Dendy, 1913**; *Hemigellius calyx var. indica* **(Dendy, 1922)**; *Hymedesmia (Stylopus) dendyi* **Burton, 1930**; *Leucetta pyriformis* **Dendy, 1913**; *Monanchora lipochela* **(Dendy, 1922)**; *Neopetrosia tuberosa* **(Dendy, 1922)**; *Oceanapia porosa* **(Dendy, 1922)**; *Paracornulum strepsichela* **(Dendy, 1922)**; *Petrosia (Petrosia) mammiformis* **Dendy, 1922**; *Phorbas clathrodes* **(Dendy, 1922)**; *Plakinastrella minor* **(Dendy, 1916)**; *Stelletta cavernosa* **(Dendy, 1916)**; *Stylissa conulosa* **(Dendy, 1922)**

98. Mascarene Islands Ecoregion (35)

	Agelas mauritiana **(Carter, 1883)**; *Chondrilla sacciformis* **Carter, 1879**; *Clathrina compacta* **(Schuffner, 1877)**; *Cliona jullieni* **Topsent, 1891**; *Dysidea enormis* **(Hyatt, 1877)**; *Dysidea spinosa* **(Hyatt, 1877)**; *Echinodictyum pykii* **(Carter, 1879)**; *Eurypon cactoides* **(Burton & Rao, 1932)**; *Fasciospongia pikei* **(Hyatt, 1877)**; *Heterotella corbicula* **(Bowerbank, 1862)**; *Hippospongia mauritiana* **(Hyatt, 1877)**; *Hyattella intestinalis* **(Lamarck, 1814)**; *Ircinia intertexta* **(Hyatt, 1877)**; *Laocoetis perion* **Lévi, 1986**; *Leucaltis mauritiana* **Schuffner, 1877**; *Leucandra claviformis* **Schuffner, 1877**; *Leucandra echinata* **Schuffner, 1877**; *Leucandra falcigera* **Schuffner, 1877**; *Lithoplocamia lithistoides* **Dendy, 1922**; *Monanchora laevissima* **(Dendy, 1922)**; *Mycale (Zygomycale) parishii* **(Bowerbank, 1875)**; *Petrosia (Strongylophora) mauritiana* **(Carter, 1885)**; *Phlyctaenopora (Barbozia) primitiva* **(Dendy, 1922)**; *Phyllospongia lamellosa* **(Esper, 1794)**; *Polymastia tubulifera* **Dendy, 1922**; *Raspailia laciniata* **(Carter, 1879)**; *Rhaphidhistia spectabilis* **Carter, 1879**; *Sigmosceptrella quadrilobata* **Dendy, 1922**; *Spongia (Spongia) hispida* **Lamarck, 1814**; *Spongia (Spongia) irregularis* **(Lendenfeld, 1889)**; *Stelletta mauritiana* **(Dendy, 1916)**; *Stelletta purpurea* **Ridley, 1884**; *Stylissa massa* **(Carter, 1887)**; *Sycettusa sycilloides* **(Schuffner, 1877)**; *Sycon tabulatum* **(Schuffner, 1877)**
99.	Southeast Madagascar Ecoregion (4) *Geodia crustosa* **Bösraug, 1913**; *Geodia piriformis* **Bösraug, 1913**; *Geodia poculata* **Bösraug, 1913**; *Spongia (Spongia) hispida* **Lamarck, 1814**
100.	Western and Northern Madagascar Ecoregion (150) *Acanthancora stylifera* **Burton, 1959**; *Acanthostylotella cornuta* **(Topsent, 1897)**; *Acanthotriaena crypta* **Vacelet, Vasseur & Lévi, 1976**; *Acarnus bergquistae* **van Soest, Hooper & Hiemstra, 1991**; *Acarnus wolffgangi* **Keller, 1889**; *Aciculites spinosa* **Vacelet & Vasseur, 1971**; *Aciculites tulearensis* **Vacelet & Vasseur, 1965**; *Agelas bispiculata* **Vacelet, Vasseur & Lévi, 1976**; *Agelas marmarica* **Lévi, 1958**; *Agelas mauritiana* **(Carter, 1883)**; *Alectona primitiva* **Topsent, 1932**; *Amorphinopsis fistulosa* **(Vacelet, Vasseur & Lévi, 1976)**; *Ancorina nanosclera* **Lévi, 1967**; *Astrosclera willeyana* **Lister, 1900**; *Aulospongus gardineri* **(Dendy, 1922)**; *Axinyssa aplysinoides* **(Dendy, 1922)**; *Batzella aurantiaca* **(Lévi, 1958)**; *Biemna anisotoxa* **Lévi, 1963**; *Biemna bihamigera* **(Dendy, 1922)**; *Biemna laboutei* **Hooper, 1996**; *Bubaris conulosa* **Vacelet & Vasseur, 1971**; *Callipelta cavernicola* **(Vacelet & Vasseur, 1965)**; *Callipelta mixta* **Vacelet, Vasseur & Lévi, 1976**; *Callipelta ornata* **Sollas, 1888**; *Callyspongia (Toxochalina) robusta* **(Ridley, 1884)**; *Carteriospongia foliascens* **(Pallas, 1766)**; *Carteriospongia pennatula* **Ridley, 1884**; *Chondrilla australiensis* **Carter, 1873**; *Chondrilla mixta* **Schulze, 1877**; *Chondrilla sacciformis* **Carter, 1879**; *Chondropsis lamella* **(Lendenfeld, 1888)**; *Chondrosia debilis* **Thiele, 1900**; *Cinachyrella australiensis* **(Carter, 1886)**; *Cinachyrella schulzei* **(Keller, 1891)**; *Ciocalypta microstrongylata* **Vacelet, Vasseur & Lévi, 1976**; *Cladorhiza nematophora* **Lévi, 1964**; *Clathria (Clathria) foliascens* **Vacelet & Vasseur, 1971**; *Clathria (Clathria) spongodes* **Dendy, 1922**; *Clathria (Microciona) microxea* **(Vacelet & Vasseur, 1971)**; *Clathria (Microciona) vacelettia* **Hooper, 1996**; *Clathria (Thalysias) abietina* **(Lamarck, 1814)**; *Clathria (Thalysias) vulpina* **(Lamarck, 1814)**; *Clathria (Wilsonella) cercidochela* **(Vacelet & Vasseur, 1971)**; *Clathria dichela* **sensu Vacelet, Vasseur & Lévi, 1976**; *Cliona mucronata* **Sollas, 1878**; *Coelodischela diatomorpha* **Vacelet, Vasseur & Lévi, 1976**; *Cornulella minima* **(Vacelet, Vasseur & Lévi, 1976)**; *Crambe acuata* **(Lévi, 1958)**; *Diacarnus globosus* **(Vacelet, Vasseur & Lévi, 1976)**; *Didiscus aceratus* **(Ridley & Dendy, 1886)**; *Didiscus anisodiscus* **Vacelet & Vasseur, 1971**; *Didiscus placospongioides* **Dendy, 1922**; *Discodermia dubia* **Vacelet & Vasseur, 1971**; *Discodermia japonica* **Döderlein, 1884**; *Discodermia panoplia* **Sollas, 1888**; *Echinodictyum jousseaumi* **Topsent, 1892**; *Ecionemia cinerea* **Thiele, 1900**;

	Erylus lendenfeldi **Sollas, 1888**; *Farrea occa* **Bowerbank, 1862**; *Farrea occa occa* **Bowerbank, 1862**; *Gelliodes flagellifera* **Vacelet, Vasseur & Lévi, 1976**; *Gelliodes nossibea* **Lévi, 1956**; *Gelliodes petrosioides* **Dendy, 1905**; *Geodia carcinophila* **(Lendenfeld, 1897)**; *Geodia composita* **Bösraug, 1913**; *Geodia peruncinata* **Dendy, 1905**; *Geodia sollasi* **(Lendenfeld, 1888)**; *Geodia sphaerulifer* **(Vacelet & Vasseur, 1965)**; *Haliclona (Gellius) cymaeformis* **(Esper, 1794)**; *Haliclona (Gellius) friabilis* **(Lévi, 1956)**; *Haliclona (Gellius) ridleyi* **(Hentschel, 1912)**; *Haliclona (Halichoclona) cioniformis* **(Lévi, 1956)**; *Haliclona fragilis* **(Vacelet, Vasseur & Lévi, 1976)**; *Haliclona madagascarensis* **Vacelet, Vasseur & Lévi, 1976**; *Haliclona polypoides* **(Vacelet, Vasseur & Lévi, 1976)**; *Haliclona striata* **Vacelet, Vasseur & Lévi, 1976**; *Haliclona tulearensis* **Vacelet, Vasseur & Lévi, 1976**; *Halisarca ectofibrosa* **Vacelet, Vasseur & Lévi, 1976**; *Hemiasterella complicata* **Topsent, 1919**; *Hemiasterella strongylophora* **Lévi, 1956**; *Higginsia petrosioides* **Dendy, 1922**; *Hippospongia laxa* **Lendenfeld, 1889**; *Homophymia lamellosa* **Vacelet & Vasseur, 1971**; *Hyrtios cavernosus* **(Vacelet, Vasseur & Lévi, 1976)**; *Igernella mirabilis* **Lévi, 1961**; *Iotrochota purpurea* **(Bowerbank, 1875)**; *Ircinia conulosa* **(Ridley, 1884)**; *Ircinia cylindracea* **Vacelet, Vasseur & Lévi, 1976**; *Jaspis diastra* **(Vacelet & Vasseur, 1965)**; *Kaliapsis incrustans* **(Vacelet & Vasseur, 1971)**; *Lelapiella incrustans* **Vacelet, 1977**; *Lepidoleucon inflatum* **Vacelet, 1967**; *Liosina arenosa* **(Vacelet & Vasseur, 1971)**; *Monanchora unguiculata* **(Dendy, 1922)**; *Mycale (Carmia) microxea* **Vacelet, Vasseur & Lévi, 1976**; *Mycale (Grapelia) vaceleti* **Hajdu, 1995**; *Mycale (Mycale) gravelyi* **Burton, 1937**; *Mycale (Naviculina) cleistochela* **Vacelet & Vasseur, 1971**; *Mycale (Naviculina) flagellifera* **Vacelet & Vasseur, 1971**; *Mycale (Zygomycale) parishii* **(Bowerbank, 1875)**; *Mycale imperfecta* **Baer, 1906**; *Myrmekioderma granulatum* **(Esper, 1794)**; *Oceanapia cribrirhina* **(Vacelet & Vasseur, 1971)**; *Oceanapia dura* **(Vacelet & Vasseur, 1971)**; *Oceanapia incrustata* **(Dendy, 1922)**; *Oceanapia minuta* **(Vacelet, Vasseur & Lévi, 1976)**; *Oceanapia mucronata* **(Vacelet, Vasseur & Lévi, 1976)**; *Oscarella ochreacea* **Muricy & Pearse, 2004**; *Paracornulum strepsichela* **(Dendy, 1922)**; *Paramurrayona corticata* **Vacelet, 1967**; *Petrosia (Petrosia) microxea* **(Vacelet, Vasseur & Lévi, 1976)**; *Phakellia labellum* **(Lamarck, 1814)**; *Phorbas scabida* **(sensu Vacelet, Vasseur & Lévi, 1976)**; *Phyllospongia papyracea* **(Esper, 1794)**; *Pione margaritiferae* **(Dendy, 1905)**; *Plakina corticioides* **Vacelet, Vasseur & Lévi, 1976**; *Plakinastrella ceylonica* **(Dendy, 1905)**; *Plectroninia minima* **Vacelet, 1967**; *Plectroninia pulchella* **Vacelet, 1967**; *Plectroninia radiata* **Vacelet, 1967**; *Plectroninia tecta* **Vacelet, 1967**; *Plectroninia vasseuri* **Vacelet, 1967**; *Rhabdocalyptus monstraster* **Tabachnick, 1994**; *Scopalina rubra* **(Vacelet & Vasseur, 1971)**; *Sigmosceptrella quadrilobata* **Dendy, 1922**; *Spheciospongia florida* **(Lendenfeld, 1897)**; *Spheciospongia inconstans* **(Dendy, 1887)**; *Spheciospongia poterionides* **(Vacelet & Vasseur, 1971)**; *Spirastrella decumbens* **Ridley, 1884**; *Spirastrella pachyspira* **Lévi, 1958**; *Spirorhabdia alata* **Vacelet, Vasseur & Lévi, 1976**; *Spongosorites hentscheli* **Lévi, 1956**; *Stelletta discolor* **Bösraug, 1913**; *Stelletta osculifera* **(Lévi, 1964)**; *Stelletta tulearensis* **Vacelet, Vasseur & Lévi, 1976**; *Stelletta variohamata* **Thiele, 1900**; *Strongylamma arenosa* **(Vacelet & Vasseur, 1971)**; *Stylissa carteri* **(Dendy, 1889)**; *Terpios granulosa* **Bergquist, 1967**; *Tetilla ridleyi* **Sollas, 1888**; *Tetrapocillon minor* **Pulitzer-Finali, 1993**; *Theonella conica* **(Kieschnick, 1896)**; *Theonella swinhoei* **Gray, 1868**; *Thorecta madagascarensis* **Lendenfeld, 1889**; *Timea curvistellifera* **(Dendy, 1905)**; *Tulearinia stylifera* **Vacelet, 1977**; *Vaceletia crypta* **(Vacelet, 1977)**; *Xestospongia testudinaria* **(Lamarck, 1815)**; *Xestospongia viridenigra* **(Vacelet, Vasseur & Lévi, 1976)**; *Zyzzya fuliginosa* **(Carter, 1879)**
101.	Bight of Sofala/Swamp Coast Ecoregion (1) (excluded) *Axinella tenuidigitata var. oxeata* **Thomas, 1979**
102.	Delagoa Ecoregion (34) *Acanthotetilla enigmatica* **(Lévi, 1964)**; *Amorphinopsis foetida* **(Dendy, 1889)**; *Ancorina*

corticata **Lévi, 1964**; *Astrosclera willeyana* **Lister, 1900**; *Auletta elongata* **Dendy, 1905**; *Axinella donnani* **(Bowerbank, 1873)**; *Axinella tenuidigitata* **Dendy, 1905**; *Callipelta thoosa* **Lévi, 1964**; *Callyspongia (Cladochalina) diffusa* **(Ridley, 1884)**; *Chondrilla australiensis* **Carter, 1873**; *Clathria (Clathria) indica* **Dendy, 1889**; *Clathria (Clathria) inhacensis* **Thomas, 1979**; *Clathria (Thalysias) vulpina* **(Lamarck, 1814)**; *Cliona mucronata* **Sollas, 1878**; *Coelosphaera (Coelosphaera) navicelligera* **(Ridley, 1885)**; *Coelosphaera (Coelosphaera) solenoidea* **(Lévi, 1964)**; *Dragmacidon agariciforme* **(Dendy, 1905)**; *Dysidea gumminea* **Ridley, 1884**; *Echinoclathria rimosa* **(Ridley, 1884)**; *Fasciospongia benoiti* **(Thomas, 1979)**; *Hyrtios erectus* **(Keller, 1889)**; *Iotrochota baculifera* **Ridley, 1884**; *Liosina paradoxa* **Thiele, 1899**; *Phakettia ridleyi* **(Dendy, 1887)**; *Pione margaritiferae* **(Dendy, 1905)**; *Rhabdastrella actinosa* **(Lévi, 1964)**; *Rhabdastrella rowi* **(Dendy, 1916)**; *Spheciospongia inconstans* **(Dendy, 1887)**; *Spirastrella punctulata* **Ridley, 1884**; *Stelletta freitasi* **Lévi, 1964**; *Stelletta osculifera* **(Lévi, 1964)**; *Stelletta purpurea* **Ridley, 1884**; *Terpios cruciata* **(Dendy, 1905)**; *Tethya robusta* **(Bowerbank, 1873)**

Temperate South America Realm

49. *Tristan Gough Province*

189. Tristan Gough Ecoregion (21)

Amphilectus rugosus **(Thiele, 1905)**; *Amphoriscus gastrorhabdifer* **(Burton, 1932)**; *Antho (Acarnia) simplicissima* **(Burton, 1932)**; *Axinyssa paradoxa* **(Ridley & Dendy, 1886)**; *Bubaris murrayi* **Topsent, 1913**; *Caulocalyx tener* **Schulze, 1886**; *Caulophacus (Caulodiscus) polyspicula* **Tabachnick, 1990**; *Ceratopsion incrustans* **(Burton, 1932)**; *Clathria (Clathria) discreta* **(Thiele, 1905)**; *Clathria (Microciona) antarctica* **(Topsent, 1917)**; *Desmacella suberitoides* **(Burton, 1932)**; *Gelliodes licheniformis* **(Lamarck, 1814)**; *Haliclona petrosioides* **Burton, 1932**; *Hexactinella divergens* **Tabachnick, 1990**; *Hyalonema (Leptonema) campanula longispicula* **Tabachnick, 1990**; *Hyrtios altus* **(Poléjaeff, 1884)**; *Leucascus leptoraphis* **(Jenkin, 1908)**; *Leucetta homoraphis* **Poléjaeff, 1883**; *Pericharax carteri* **Poléjaeff, 1883**; *Poecillastra incrustans* **Sollas, 1888**; *Pseudosuberites exalbicans* **Topsent, 1913**

Temperate Southern Africa Realm

50. *Benguela Province*

190. Namib Ecoregion (excluded)

191. Namaqua Ecoregion (138)

Aaptos alphiensis **Samaai & Gibbons,** 2005; *Amphilectus informis* **(Stephens, 1915)**; *Antho (Acarnia) kellyae* **Samaai & Gibbons, 2005**; *Aplysina minuta* **Lendenfeld, 1889**; *Artemisina vulcani* **Lévi, 1963**; *Biemna anisotoxa* **Lévi, 1963**; *Biemna megalosigma var. sigmodragma* **Lévi, 1963**; *Biemna polyphylla* **Lévi, 1963**; *Biemna rhabdostyla* **Uriz, 1988**; *Callyspongia (Callyspongia) tubulosa* **sensu (Esper, 1797)**; *Callyspongia hospitalis* **(Stephens, 1915)**; *Clathria (Axosuberites) benguelaensis* **Samaai & Gibbons, 2005**; *Clathria (Clathria) axociona* **Lévi, 1963**; *Clathria (Clathria) conica* **Lévi, 1963**; *Clathria (Clathria) dayi* **Lévi, 1963**; *Clathria (Clathria) hexagonopora* **Lévi, 1963**; *Clathria (Clathria) omegiensis* **Samaai & Gibbons, 2005**; *Clathria (Clathria) pachystyla* **Lévi, 1963**; *Clathria (Clathria) parva* **Lévi, 1963**; *Clathria (Clathria) rhaphidotoxa* **Stephens, 1915**; *Clathria (Isociella) oudekraalensis* **Samaai & Gibbons, 2005**; *Clathria (Microciona) ixauda* **(Lévi, 1969)**; *Clathria (Microciona) namibiensis* **(Uriz, 1984)**; *Clathria (Microciona) stephensae* **Hooper, 1996**; *Clathria (Microciona) tenuis* **(Stephens, 1915)**; *Clathria (Microciona) urizae* **Hooper, 1996**; *Clathria (Thalysias) hooperi* **Samaai & Gibbons, 2005**; *Clathria (Thalysias) lissoclada* **(Burton, 1934)**; *Crambe acuata* **(Lévi, 1958)**; *Craniella australis* **Samaai & Gibbons, 2005**; *Craniella cranium* **(Müller, 1776)**; *Desmacidon clavatum* **Lévi, 1969**; *Echinochalina (Echinochalina) isochelifera* **(Uriz,**

1988); *Echinoclathria dichotoma* **(Lévi, 1963)**; *Echinodictyum macroxiphera* **Lévi, 1969**; *Ectyonopsis flabellata* **(Lévi, 1963)**; *Ectyonopsis pluridentata* **(Lévi, 1963)**; *Erylus amorphus* **Burton, 1926**; *Erylus gilchristi* **Burton, 1926**; *Eurypon fulvum* **Lévi, 1969**; *Eurypon miniaceum* **Thiele, 1905**; *Fibulia ramosa* **(Ridley & Dendy, 1886)**; *Forcepia (Leptolabis) australis* **(Lévi, 1963)**; *Gelliodes coscinopora* **Lévi, 1969**; *Geodia libera* **Stephens, 1915**; *Geodia littoralis* **Stephens, 1915**; *Guitarra indica* **Dendy, 1916**; *Halichondria (Halichondria) capensis* **Samaai & Gibbons, 2005**; *Halichondria (Halichondria) gilvus* **Samaai & Gibbons, 2005**; *Haliclona (Gellius) glacialis* **(Ridley & Dendy, 1886)**; *Haliclona (Gellius) jorii* **(Uriz, 1984)**; *Haliclona (Haliclona) anonyma* **(Stephens, 1915)**; *Haliclona (Haliclona) stilensis* **Burton, 1933**; *Haliclona (Reniera) ciocalyptoides* **Burton, 1933**; *Haliclona saldanhae* **(Stephens, 1915)**; *Haliclona stephensi* **Burton, 1932**; *Haliclona submonilifera* **Uriz, 1988**; *Haliclonissa sacciformis* **Burton, 1932**; *Halisarca pachyderma* **Lévi, 1969**; *Hamacantha (Vomerula) esperioides* **Ridley & Dendy, 1886**; *Hexadella kirkpatricki* **Burton, 1926**; *Hymedesmia (Hymedesmia) aurantiaca* **Lévi, 1963**; *Hymedesmia (Hymedesmia) parva* **Stephens, 1915**; *Hymenancora tenuissima* **(Thiele, 1905)**; *Hymeniacidon stylifera* **(Stephens, 1915)**; *Hymeniacidon sublittoralis* **Samaai & Gibbons, 2005**; *Inflatella belli* **(Kirkpatrick, 1907)**; *Iophon cheliferum* **Ridley & Dendy, 1886**; *Isodictya alata* **(Stephens, 1915)**; *Isodictya chichatouzae* **Uriz, 1984**; *Isodictya compressa* **(Esper, 1794)**; *Isodictya conulosa* **(Ridley & Dendy, 1886)**; *Isodictya ectofibrosa* **(Lévi, 1963)**; *Isodictya elastica* **(Vosmaer, 1880)**; *Isodictya frondosa* **(Lévi, 1963)**; *Isodictya multiformis* **(Stephens, 1915)**; *Latrunculia (Biannulata) lunaviridis* **Samaai, Gibbons, Kelly & Davies-Coleman, 2003**; *Latrunculia (Latrunculia) brevis* **Ridley & Dendy, 1886**; *Lissodendoryx (Anomodoryx) coralgardeniensis* **Samaai & Gibbons, 2005**; *Lissodendoryx (Lissodendoryx) digitata* **(Ridley & Dendy, 1886)**; *Lissodendoryx (Lissodendoryx) simplex* **(Baer, 1906)**; *Mycale (Aegogropila) tapetum* **Samaai & Gibbons, 2005**; *Mycale (Carmia) levii* **Samaai & Gibbons, 2005**; *Mycale (Carmia) pulvinus* **Samaai & Gibbons, 2005**; *Mycale (Mycale) anisochela* **Lévi, 1963**; *Mycale (Mycale) massa* **(Schmidt, 1862)**; *Mycale (Mycale) trichela* **Lévi, 1963**; *Mycale (Oxymycale) stephensae* **Samaai & Gibbons, 2005**; *Mycale (Paresperella) atlantica* **(Stephens, 1917)**; *Mycale (Paresperella) curvisigma* **Lévi, 1969**; *Mycale (Paresperella) levii* **(Uriz, 1987)**; *Mycale (Paresperella) toxifera* **(Lévi, 1963)**; *Mycale diastrophochela* **Lévi, 1969**; *Myxilla (Burtonanchora) sigmatifera* **(Lévi, 1963)**; *Myxilla (Ectyomyxilla) chilensis* **Thiele, 1905**; *Myxilla (Ectyomyxilla) kerguelensis* **(Hentschel, 1914)**; *Oceanapia atlantica* **Lévi, 1969**; *Paracornulum coherens* **Lévi, 1963**; *Penares sphaera* **(Lendenfeld, 1907)**; *Petrosia (Strongylophora) vulcaniensis* **Samaai & Gibbons, 2005**; *Phorbas bardajii* **(Uriz, 1988)**; *Phorbas benguelensis* **(Uriz, 1984)**; *Phorbas dayi* **(Lévi, 1963)**; *Phorbas lamellatus* **(Lévi, 1963)**; *Phorbas pustulosus* **(Carter, 1882)**; *Plocamiancora walvisensis* **(Uriz, 1988)**; *Plocamionida ambigua* **(Bowerbank, 1866)**; *Poecillastra compressa* **(Bowerbank, 1866)**; *Polymastia atlantica* **Samaai & Gibbons, 2005**; *Polymastia bouryesnaultae* **Samaai & Gibbons, 2005**; *Polymastia infrapilosa* **Topsent, 1927**; *Polymastia isidis* **Thiele, 1905**; *Polymastia littoralis* **Stephens,** 1915; *Protosuberites hendricksi* **Samaai & Gibbons, 2005**; *Pseudosuberites hyalinus* **(Ridley & Dendy, 1886)**; *Raspailia (Hymeraphiopsis) irregularis* **Hentschel, 1914**; *Raspailia (Raspailia) urizae* **Hooper, 2012**; *Rossella antarctica* **Carter, 1872**; *Smenospongia nuda* **(Lévi, 1969)**; *Spongia (Spongia) brunnea* **Lévi, 1969**; *Spongia (Spongia) violacea* **Lévi, 1969**; *Stelletta agulhana* **Lendenfeld, 1907**; *Stelletta farcimen* **Lendenfeld, 1907**; *Stelletta rugosa* **Burton, 1926**; *Stelletta sphaerica* **Burton, 1926**; *Stelletta trisclera* **Lévi, 1967**; *Strongylodesma areolata* **Lévi, 1969**; *Suberea pedunculata* **(Lévi, 1969)**; *Tedania (Tedania) brondstedi* **Burton, 1936**; *Tedania (Tedania) scotiae* **Stephens, 1915**; *Tedania (Tedania) stylonychaeta* **Lévi, 1963**; *Tedania (Tedania) tubulifera* **Lévi, 1963**; *Tethya rubra* **Samaai & Gibbons, 2005**; *Tetilla capillosa* **Lévi, 1967**; *Tetilla casula* **(Carter, 1871)**; *Trachycladus spinispirulifer* **(Carter, 1879)**; *Tsitsikamma scurra* **Samaai, Gibbons, Kelly & Davies-Coleman, 2003**; *Xestospongia hispida* **(Ridley & Dendy, 1886)**

51. ***Agulhas Province***

192. Agulhas Bank Ecoregion (131)

Acanthascus (Rhabdocalyptus) baculifer **(Schulze, 1904)**; *Acarnus claudei* **van Soest, Hooper & Hiemstra, 1991**; *Alectona wallichii* **(Carter, 1874)**; *Amphilectus informis* **(Stephens, 1915)**; *Amphiute lepadiformis* **Borojevic, 1967**; *Amphoriscus kryptoraphis* **Urban, 1908**; *Ancorina corticata* **Lévi, 1964**; *Aplysina capensis* **Carter, 1875**; *Arthuria africana* **(Klautau & Valentine, 2003)**; *Arthuria hirsuta* **(Klautau & Valentine, 2003)**; *Biemna anisotoxa* **Lévi, 1963**; *Biemna pedonculata* **Lévi, 1963**; *Callyspongia (Cladochalina) foliacea* **(Esper, 1797)**; *Caulophacus (Caulophacus) basispinosus* **Lévi, 1964**; *Caulophacus (Caulophacus) galatheae* **Lévi, 1964**; *Ceratopsion microxephora* **(Kirkpatrick, 1903)**; *Chelotropella sphaerica* **Lendenfeld, 1907**; *Cinachyrella hamata* **(Lendenfeld, 1907)**; *Ciocalypta tyleri* **Bowerbank, 1873**; *Cladorhiza ephyrula* **Lévi, 1964**; *Clathria (Clathria) elastica* **Lévi, 1963**; *Clathria (Clathria) lobata* **Vosmaer, 1880**; *Clathria (Clathria) zoanthifera* **Lévi, 1963**; *Clathria (Thalysias) delaubenfelsi* **(Lévi, 1963)**; *Clathria (Thalysias) flabellata* **(Burton, 1936)**; *Clathria (Thalysias) nervosa* **(Lévi, 1963)**; *Clathria (Thalysias) oxitoxa* **Lévi, 1963**; *Clathrina cordata* **(Haeckel, 1872)**; *Clathrina rotunda* **Klautau & Valentine, 2003**; *Crambe acuata* **(Lévi, 1958)**; *Craniella metaclada* **(Lendenfeld, 1907)**; *Crella (Grayella) erecta* **Lévi, 1963**; *Crella caespes* **(Ehlers, 1870)**; *Cyclacanthia bellae* **(Samaai, Gibbons, Kelly & Davies-Coleman, 2003)**; *Echinoclathria dichotoma* **(Lévi, 1963)**; *Ectyonopsis flabellata* **(Lévi, 1963)**; *Erylus polyaster* **Lendenfeld, 1907**; *Esperiopsis papillata* **(Vosmaer, 1880)**; *Fibulia ramosa* **(Ridley & Dendy, 1886)**; *Forcepia (Forcepia) agglutinans* **Burton, 1933**; *Geodia gallica* **(Lendenfeld, 1907)**; *Geodia globosa* **(Baer, 1906)**; *Geodia perarmata* **Bowerbank, 1873**; *Geodia robusta* **Lendenfeld, 1907**; *Geodia stellata* **Lendenfeld, 1907**; *Grantessa ramosa* **(Haeckel, 1872)**; *Grantessa rarispinosa* **Borojevic, 1967**; *Grantia socialis* **Borojevic, 1967**; *Guitarra indica* **Dendy, 1916**; *Haliclona (Gellius) glacialis* **(Ridley & Dendy, 1886)**; *Haliclona (Haliclona) stilensis* **Burton, 1933**; *Haliclona (Reniera) ciocalyptoides* **Burton, 1933**; *Haliclona simplicissima* **(Burton, 1933)**; *Hamacantha (Vomerula) esperioides* **Ridley & Dendy, 1886**; *Heteropia glomerosa* **(Bowerbank, 1873)**; *Higginsia bidentifera* **(Ridley & Dendy, 1886)**; *Homaxinella flagelliformis* **(Ridley & Dendy, 1886)**; *Hymedesmia (Hymedesmia) aurantiaca* **Lévi, 1963**; *Hymeniacidon kerguelensis var. capensis* **Hentschel, 1914**; *Iophon cheliferum* **Ridley & Dendy, 1886**; *Isodictya conulosa* **(Ridley & Dendy, 1886)**; *Isodictya ectofibrosa* **(Lévi, 1963)**; *Isodictya elastica* **(Vosmaer, 1880)**; *Isodictya foliata* **(Carter, 1885)**; *Isodictya grandis* **(Ridley & Dendy, 1886)**; *Isodictya lenta* **(Vosmaer, 1880)**; *Isodictya multiformis* **(Stephens, 1915)**; *Latrunculia (Biannulata) algoaensis* **Samaai, Janson & Kelly, 2012**; *Latrunculia (Biannulata) gotzi* **Samaai, Janson & Kelly, 2012**; *Latrunculia (Biannulata) kerwathi* **Samaai, Janson & Kelly, 2012**; *Latrunculia (Biannulata) microacanthoxea* **Samaai, Gibbons, Kelly & Davies-Coleman, 2003**; *Leiosella caliculata* **Lendenfeld, 1889**; *Leucandra algoaensis* **(Bowerbank, 1864)**; *Leucandra armata* **(Urban, 1908)**; *Leucandra bathybia* **(Haeckel, 1869)**; *Leucandra bleeki* **(Haeckel, 1872)**; *Leucandra hentschelii* **Brøndsted, 1931**; *Leucandra minor* **(Urban, 1908)**; *Leucandra spissa* **(Urban, 1909)**; *Leucetta trigona* **Haeckel, 1872**; *Leucilla australiensis* **(Carter, 1886)**; *Leucilla capsula* **(Haeckel, 1870)**; *Leucosolenia eustephana* **Haeckel, 1872**; *Lissodendoryx (Ectyodoryx) arenaria* **Burton, 1936**; *Lissodendoryx (Lissodendoryx) areolata* **Lévi, 1963**; *Lissodendoryx (Lissodendoryx) digitata* **(Ridley & Dendy, 1886)**; *Lissodendoryx (Lissodendoryx) simplex* **(Baer, 1906)**; *Lissodendoryx (Lissodendoryx) stephensoni* **Burton, 1936**; *Lissodendoryx (Lissodendoryx) ternatensis* **(Thiele, 1903)**; *Lithochela conica* **Burton, 1929**; *Macandrewia auris* **Lendenfeld, 1907**; *Mycale (Aegogropila) meridionalis* **Lévi, 1963**; *Mycale (Aegogropila) simonis* **(Ridley & Dendy, 1886)**; *Mycale (Mycale) anisochela* **Lévi, 1963**; *Mycale (Mycale) sulcata* **Hentschel, 1911**; *Neopetrosia similis* **(Ridley & Dendy, 1886)**; *Pachymatisma areolata* **Bowerbank, 1872**; *Penares alata* **(Lendenfeld, 1907)**; *Penares obtusus* **(Lendenfeld, 1907)**; *Penares sphaera* **(Lendenfeld, 1907)**; *Phorbas clathratus* **(Lévi, 1963)**; *Phorbas fibrosus* **(Lévi, 1963)**; *Phyllospongia schulzei* **Lendenfeld, 1889**;

Poecillastra tenuirhabda **(Lendenfeld, 1907)**; *Polymastia atlantica* **Samaai & Gibbons, 2005**; *Proteleia sollasi* **Dendy & Ridley, 1886**; *Raspailia rigida* **Ridley & Dendy, 1886**; *Rhabdocalyptus baculifer* **Schulze, 1904**; *Spheciospongia capensis* **(Carter, 1882)**; *Stelletta agulhana* **Lendenfeld, 1907**; *Stelletta capensis* **Lévi, 1967**; *Stelletta grubioides* **Burton, 1926**; *Strongylodesma algoaensis* **Samaai, Gibbons, Kelly & Davies-Coleman, 2003**; *Strongylodesma tsitsikammaensis* **Samaai, Gibbons, Kelly & Davies-Coleman, 2003**; *Stryphnus progressus* **(Lendenfeld, 1907)**; *Stryphnus unguiculus* **Sollas, 1886**; *Suberites stilensis* **Burton, 1933**; *Sycodorus hystrix* **Haeckel, 1870**; *Sycon defendens* **Borojevic, 1967**; *Sycon dunstervillia* **(Haeckel, 1872)**; *Sycon lunulatum* **(Haeckel, 1872)**; *Tedania (Tedania) scotiae* **Stephens, 1915**; *Tedania (Tedania) stylonychaeta* **Lévi, 1963**; *Tedania (Tedania) tubulifera* **Lévi, 1963**; *Tetilla bonaventura* **Kirkpatrick, 1902**; *Tetilla casula* **(Carter, 1871)**; *Tetilla pedonculata* **Lévi, 1967**; *Tetrapocillon novaezealandiae* **Brøndsted, 1924**; *Trachycladus spinispirulifer* **(Carter, 1879)**; *Tsitsikamma favus* **Samaai & Kelly, 2002**; *Tsitsikamma pedunculata* **Samaai, Gibbons, Kelly & Davies-Coleman, 2003**

193. Natal Ecoregion (101)

Aaptos nuda **(Kirkpatrick, 1903)**; *Ancorina corticata* **Lévi, 1964**; *Ancorina nanosclera* **Lévi, 1967**; *Aulospongus involutus* **(Kirkpatrick, 1903)**; *Axinella natalensis* **(Kirkpatrick, 1903)**; *Axinella weltnerii* **(Lendenfeld, 1897)**; *Axinyssa tethyoides* **Kirkpatrick, 1903**; *Callyspongia (Toxochalina) dendyi* **(Burton, 1931)**; *Callyspongia (Toxochalina) ridleyi* **(Dendy, 1905)**; *Callyspongia (Toxochalina) robusta* **(Ridley, 1884)**; *Callyspongia mammillata* **(Burton, 1933)**; *Clathria (Clathria) indica* **Dendy, 1889**; *Clathria (Clathria) irregularis* **(Burton, 1931)**; *Clathria (Clathria) juncea* **Burton, 1931**; *Clathria (Clathria) oculata* **Burton, 1933**; *Clathria (Clathria) whiteleggii* **Dendy, 1922**; *Clathria (Thalysias) anomala* **(Burton, 1933)**; *Clathria (Thalysias) cullingworthi* **Burton, 1931**; *Clathria (Thalysias) delaubenfelsi* **(Lévi, 1963)**; *Clathria (Thalysias) procera* **(Ridley, 1884)**; *Coelosphaera (Coelosphaera) navicelligera* **(Ridley, 1885)**; *Coscinoderma nardorus* **(Lendenfeld, 1886)**; *Crateromorpha (Crateromorpha) lankesteri* **Kirkpatrick, 1902**; *Crella (Grayella) erecta* **Lévi, 1963**; *Cyclacanthia cloverlyae* **Samaai, Govender & Kelly, 2004;** *Cyclacanthia mzimayiensis* **Samaai, Govender & Kelly, 2004**; *Cymbastela sodwaniensis* **Samaai, Pillay & Kelly, 2009**; *Darwinella warreni* **Topsent, 1905**; *Dercitus natalensis* **(Burton, 1926)**; *Dictyodendrilla caespitosa* **(Carter, 1886)**; *Discodermia natalensis* **Kirkpatrick, 1903**; *Dragmacidon sanguineum* **(Burton, 1933)**; *Dysidea chalinoides* **(Burton, 1931)**; *Echinodictyum jousseaumi* **Topsent, 1892**; *Echinodictyum marleyi* **Burton, 1931**; *Ecionemia baculifera* **(Kirkpatrick, 1903)**; *Endectyon gorgonioides* **(Kirkpatrick, 1903)**; *Erylus amorphus* **Burton, 1926**; *Fangophilina gilchristi* **(Kirkpatrick, 1902)**; *Gastrophanella mammilliformis* **Burton, 1929**; *Geodia basilea* **Lévi, 1964**; *Geodia dendyi* **Burton, 1926**; *Geodia labyrinthica* **(Kirkpatrick, 1903)**; *Geodia littoralis* **Stephens, 1915**; *Geodia megaster* **Burton, 1926**; *Geodia ovifractus* **Burton, 1926**; *Geodia ovifractus var. cyathioides* **Burton, 1926**; *Grantessa ramosa* **(Haeckel, 1872)**; *Guitarra indica* **Dendy, 1916**; *Hemiasterella vasiformis* **(Kirkpatrick, 1903)**; *Hemiasterella vasiformis var. minor* **(Kirkpatrick, 1903)**; *Higginsia natalensis* **Carter, 1885**; *Histodermella natalensis* **(Kirkpatrick, 1903)**; *Hyalonema (Corynonema) natalense* **(Lévi, 1964)**; *Hyalonema (Cyliconema) abyssale* **(Lévi, 1964)**; *Hyalonema (Cyliconema) curvisclera* **(Lévi, 1964)**; *Lissodendoryx (Lissodendoryx) pygmaea* **(Burton, 1931)**; *Lissodendoryx (Lissodendoryx) ternatensis* **(Thiele, 1903)**; *Lithobactrum forte* **Kirkpatrick, 1903**; *Lophophysema gilchristi* **Tabachnick & Lévi, 1999**; *Microscleroderma hirsutum* **Kirkpatrick, 1903**; *Mycale (Carmia) phyllophila* **Hentschel, 1911**; *Mycale (Grapelia) burtoni* **Hajdu, 1995**; *Mycale (Mycale) sulcata* **Hentschel, 1911**; *Mycale (Zygomycale) parishii* **(Bowerbank, 1875)**; *Oceanapia eumitum* **(Kirkpatrick, 1903)**; *Pachastrella isorrhopa* **Kirkpatrick, 1902**; *Penares orthotriaena* **Burton, 1931**; *Penares sphaera* **(Lendenfeld, 1907)**; *Petromica (Petromica) digitata*

	(Burton, 1929); *Petromica (Petromica) plumosa* **Kirkpatrick, 1903**; *Petromica (Petromica) tubulata* **(Kirkpatrick, 1903)**; *Phorbas clathratus* **(Lévi, 1963)**; *Phorbas clathrodes* **(Dendy, 1922)**; *Phorbas mollis* **(Kirkpatrick, 1903)**; *Podospongia natalensis* **(Kirkpatrick, 1903)**; *Poecillastra tuberosa* **(Lévi, 1964)**; *Polymastia disclera* **Lévi, 1964**; *Protosuberites reptans* **(Kirkpatrick, 1903)**; *Psammoclema inordinatum* **(Kirkpatrick, 1903)**; *Rhabdastrella actinosa* **(Lévi, 1964)**; *Rhabdastrella primitiva* **(Burton, 1926)**; *Rhabdastrella spinosa* **(Lévi, 1967)**; *Rhabderemia spirophora* **(Burton, 1931)**; *Rhabdocalyptus plumodigitatus* **Kirkpatrick, 1901**; *Sigmaxinella arborea* **Kirkpatrick, 1903**; *Sigmaxinella incrustans* **Kirkpatrick, 1903**; *Spheciospongia excentrica* **(Burton, 1931)**; *Stelletta agulhana* **Lendenfeld, 1907**; *Stelletta agulhana var. paucistella* **Burton, 1926**; *Stelletta cyathioides* **Burton, 1926**; *Stelletta horrens var. subcylindrica* **Burton, 1926**; *Stelletta purpurea* **Ridley, 1884**; *Stelletta retroclada* **(Lévi, 1967)**; *Stelletta rugosa* **Burton, 1926**; *Strongylodesma aliwaliensis* **Samaai, Keyzers & Davies-Coleman, 2004**; *Sycon natalense* **Borojevic, 1967**; *Tethya magna* **Kirkpatrick, 1903**; *Tetilla casula* **(Carter, 1871)**; *Triptolemma incertum* **(Kirkpatrick, 1903)**; *Waltherarndtia caliculatum* **(Kirkpatrick, 1903)**
52. ***Amsterdam-St Paul Province***	
194.	Amsterdam-St Paul Ecoregion (8) *Ancorella paulini* **Lendenfeld, 1907**; *Erylus megaster* **Lendenfeld, 1907**; *Farrea seiri* **Duplessis & Reiswig, 2004**; *Thenea centrotyla* **Lendenfeld, 1907**; *Thenea megaspina* **Lendenfeld, 1907**; *Thenea mesotriaena* **Lendenfeld, 1907**; *Thenea microspina* **Lendenfeld, 1907**; *Thenea multiformis* **Lendenfeld, 1907**
Southern Ocean Realm	
59. ***Subantarctic Islands Province***	
212.	Macquarie Island Ecoregion (excluded)
213.	Heard and Macdonald Islands Ecoregion (7) *Calyx kerguelensis* **(Hentschel, 1914)**; *Lissodendoryx (Lissodendoryx) fusca* **(Ridley & Dendy, 1886)**; *Poecillastra schulzei* **(Sollas, 1886)**; *Polymastia invaginata* **Kirkpatrick, 1907**; *Polymastia isidis* **Thiele, 1905**; *Tetilla coronida* **Sollas, 1888**; *Tetilla leptoderma* **Sollas, 1886**
214.	Kerguelen Islands Ecoregion (63) *Artemisina apollinis* **(Ridley & Dendy, 1886)**; *Biemna chilensis* **Thiele, 1905**; *Calyx kerguelensis* **(Hentschel, 1914)**; *Chondrocladia (Chondrocladia) fatimae* **Boury-Esnault & van Beveren, 1982**; *Chondrocladia (Chondrocladia) nani* **Boury-Esnault & van Beveren, 1982**; *Cinachyra barbata* **Sollas, 1886**; *Craniella coactifera* **(Lendenfeld, 1907)**; *Craniella crassispicula* **(Lendenfeld, 1907)**; *Crella (Pytheas) crassa* **(Hentschel, 1914)**; *Dendya clathrata* **(Carter, 1883)**; *Desmacidon nebulosum* **Boury-Esnault & van Beveren, 1982**; *Ectyonopsis panis* **(Boury-Esnault & van Beveren, 1982)**; *Grantia aculeata* **Urban, 1908**; *Grantia hirsuta* **(Topsent, 1907)**; *Grantia tenuis* **Urban, 1908**; *Haliclona (Gellius) constans* **(Boury-Esnault & van Beveren, 1982)**; *Haliclona (Gellius) latisigmae* **(Boury-Esnault & van Beveren, 1982)**; *Haliclona (Reniera) topsenti* **(Thiele, 1905)**; *Haliclona divulgata* **Koltun, 1964**; *Haliclona pedunculata* **(Ridley & Dendy, 1886)**; *Homaxinella balfourensis* **(Ridley & Dendy, 1886)**; *Homaxinella flagelliformis* **(Ridley & Dendy, 1886)**; *Hymedesmia (Hymedesmia) antarctica* **Boury-Esnault & van Beveren, 1982**; *Hymedesmia (Hymedesmia) mariondufresni* **Boury-Esnault & van Beveren, 1982**; *Hymeniacidon kerguelensis* **Hentschel, 1914**; *Iophon proximum var. reticulare* **Hentschel, 1914**; *Isodictya dufresni* **Boury-Esnault & van Beveren, 1982**;

	Isodictya kerguelenensis **(Ridley & Dendy, 1886)**; *Latrunculia (Latrunculia) apicalis* **Ridley & Dendy, 1886**; *Latrunculia (Latrunculia) bocagei* **Ridley & Dendy, 1886**; *Leucandra anfracta* **(Urban, 1908)**; *Leucandra astricta* **Tanita, 1942**; *Leucandra cirrhosa* **(Urban, 1908)**; *Leucandra gaussii* **(Brøndsted, 1931)**; *Leucandra kerguelensis* **(Urban, 1908)**; *Leucandra minor* **(Urban, 1908)**; *Leucandra ovata* **(Poléjaeff, 1883)**; *Leucettusa vera* **Poléjaeff, 1883**; *Leucosolenia australis* **Brøndsted, 1931**; *Leucosolenia discoveryi* **Jenkin, 1908**; *Leucosolenia incerta* **Urban, 1908**; *Leucosolenia minchini* **Jenkin, 1908**; *Megaciella pilosa* **(Ridley & Dendy, 1886)**; *Mycale (Oxymycale) acerata* **Kirkpatrick, 1907**; *Mycale fibrosa* **Boury-Esnault & van Beveren, 1982**; *Myxilla (Ectyomyxilla) chilensis* **Thiele, 1905**; *Myxilla (Ectyomyxilla) kerguelensis* **(Hentschel, 1914)**; *Phorbas domini* **(Boury-Esnault & van Beveren, 1982)**; *Plicatellopsis antarctica* **(Carter, 1876)**; *Polymastia invaginata* **Kirkpatrick, 1907**; *Polymastia isidis* **Thiele, 1905**; *Pseudosuberites sulcatus* **(Thiele, 1905)**; *Sigmosceptrella carlinae* **(Boury-Esnault & van Beveren, 1982)**; *Spanioplon werthi* **(Hentschel, 1914)**; *Stelodoryx multidentata* **(Boury-Esnault & van Beveren, 1982)**; *Stylocordyla borealis var. globosa* **Ridley & Dendy, 1886**; *Suberites microstomus* **Ridley & Dendy, 1887**; *Sycon kerguelense* **Urban, 1908**; *Tedania (Trachytedania) spinata* **(Ridley, 1881)**; *Tentorium papillatum* **(Kirkpatrick, 1908)**; *Tetilla leptoderma* **Sollas, 1886**; *Xestospongia hispida* **(Ridley & Dendy, 1886)**; *Xestospongia variabilis* **(Ridley, 1884)**
215.	Crozet Islands Ecoregion (8) *Bathydorus spinosus* **Schulze, 1886**; *Esperiopsis profunda* **Ridley & Dendy, 1886**; *Haliclona (Gellius) carduus* **(Ridley & Dendy, 1886)**; *Hyalonema (Ijimaonema) clavigerum* **Schulze, 1886**; *Iophon cheliferum* **Ridley & Dendy, 1886**; *Lissodendoryx (Ectyodoryx) nobilis* **(Ridley & Dendy, 1886)**; *Suberites mollis* **Ridley & Dendy, 1886**; *Thenea delicata* **Sollas, 1886**
216.	Prince Edward Islands Ecoregion (18) *Amphoriscus elongatus* **Poléjaeff, 1883**; *Asbestopluma (Asbestopluma) symmetrica* **(Ridley & Dendy, 1886)**; *Aulocalyx irregularis* **Schulze, 1886**; *Chondrocladia (Meliiderma) stipitata* **(Ridley & Dendy, 1886)**; *Cladorhiza tridentata* **Ridley & Dendy, 1886**; *Esperiopsis profunda* **Ridley & Dendy, 1886**; *Fibulia ramosa* **(Ridley & Dendy, 1886)**; *Haliclona (Gellius) flagellifera* **(Ridley & Dendy, 1886)**; *Haliclona (Gellius) glacialis* **(Ridley & Dendy, 1886)**; *Iophon abnormale* **Ridley & Dendy, 1886**; *Iophon cheliferum* **Ridley & Dendy, 1886**; *Iophon laminale* **Ridley & Dendy, 1886**; *Leucandra levis* **(Poléjaeff, 1883)**; *Megaciella pilosa* **(Ridley & Dendy, 1886)**; *Mycale mammiformis* **(Ridley & Dendy, 1886)**; *Myxilla (Ectyomyxilla) mariana* **Ridley & Dendy, 1886**; *Raspailia (Raspaxilla) mariana* **(Ridley & Dendy, 1886)**; *Suberites caminatus* **Ridley & Dendy, 1886**
217.	Bouvet Island Ecoregion (0) (excluded) No species recorded
218.	Peter the First Island Ecoregion (excluded)
61. ***Continental High Antarctic Province***	
224.	East Antarctic Wilkes Land Ecoregion (174) *Acanthopolymastia acanthoxa* **(Koltun, 1964)**; *Achramorpha glacialis* **Jenkin, 1908**; *Achramorpha grandinis* **Jenkin, 1908**; *Achramorpha nivalis* **Jenkin, 1908**; *Amphilectus rugosus* **(Thiele, 1905)**; *Anoxycalyx (Anoxycalyx) ijimai* **Kirkpatrick, 1907**; *Anoxycalyx*

(Scolymastra) joubini **(Topsent, 1916)**; *Aplysina minima* **Hentschel, 1914**; *Artemisina jovis* **Dendy, 1924**; *Artemisina plumosa* **Hentschel, 1914**; *Artemisina strongyla* **Hentschel, 1914**; *Artemisina tubulosa* **Koltun, 1964**; *Asbestopluma (Asbestopluma) belgicae* **(Topsent, 1901)**; *Asbestopluma (Asbestopluma) callithrix* **Hentschel, 1914**; *Asbestopluma (Asbestopluma) calyx* **Hentschel, 1914**; *Asbestopluma (Asbestopluma) obae* **Koltun, 1964**; *Biemna macrorhaphis* **Hentschel, 1914**; *Breitfussia chartacea* **(Jenkin, 1908)**; *Breitfussia vitiosa* **(Brøndsted, 1931)**; *Calyx arcuarius* **(Topsent, 1913)**; *Caulophacus (Caulophacus) antarcticus* **Schulze & Kirkpatrick, 1910**; *Caulophacus (Caulophacus) oviformis* **(Schulze, 1886)**; *Chondrocladia (Chondrocladia) antarctica* **Hentschel, 1914**; *Chonelasma choanoides* **Schulze & Kirkpatrick, 1910**; *Cinachyra antarctica* **(Carter, 1872)**; *Cinachyra barbata* **Sollas, 1886**; *Cladocroce gaussiana* **(Hentschel, 1914)**; *Cladorhiza moruliformis* **Ridley & Dendy, 1886**; *Cladothenea andriashevi* **Koltun, 1964**; *Clathria (Axosuberites) flabellata* **(Topsent, 1916)**; *Clathria (Axosuberites) nidificata* **(Kirkpatrick, 1907)**; *Clathria (Axosuberites) ramea* **(Koltun, 1964)**; *Clathria (Clathria) lipochela* **Burton, 1932**; *Clathria (Clathria) paucispicula* **(Burton, 1932)**; *Clathria (Clathria) pauper* **Brøndsted, 1927**; *Clathria (Clathria) toxipraedita* **Topsent, 1913**; *Clathria (Thalysias) koltuni* **Hooper in Hooper & Wiedenmayer, 1994**; *Coelosphaera (Coelosphaera) antarctica* **Koltun, 1976**; *Craniella sagitta* **(Lendenfeld, 1907)**; *Crella (Crella) tubifex* **(Hentschel, 1914)**; *Crella (Pytheas) crassa* **(Hentschel, 1914)**; *Crella (Pytheas) stylifera* **Hentschel, 1914**; *Dermatreton hodgsoni* **Jenkin, 1908**; *Dolichacantha macrodon* **Hentschel, 1914**; *Eurypon miniaceum* **Thiele, 1905**; *Fibulia maeandrina* **(Kirkpatrick, 1907)**; *Grantia hirsuta* **(Topsent, 1907)**; *Grantia transgrediens* **Brøndsted, 1931**; *Guancha apicalis* **Brøndsted, 1931**; *Guitarra antarctica* **Hentschel, 1914**; *Guitarra dendyi* **(Kirkpatrick, 1907)**; *Halichondria (Halichondria) prostrata* **Thiele, 1905**; *Haliclona (Gellius) glacialis* **(Ridley & Dendy, 1886)**; *Haliclona (Gellius) rudis* **(Topsent, 1901)**; *Haliclona (Gellius) tylotoxa* **(Hentschel, 1914)**; *Haliclona (Reniera) topsenti* **(Thiele, 1905)**; *Haliclona (Rhizoniera) dancoi* **(Topsent, 1913)**; *Haliclona virens* **(Topsent, 1908)**; *Hemigellius bidens* **(Topsent, 1901)**; *Hemigellius calyx* **(Ridley & Dendy, 1886)**; *Hemigellius pachyderma* **Burton, 1932**; *Holascus tenuis* **Schulze, 1904**; *Homaxinella balfourensis* **(Ridley & Dendy, 1886)**; *Homoieurete macquariense* **Reiswig & Kelly, 2011**; *Hyalonema (Cyliconema) drygalskii* **Schulze & Kirkpatrick, 1910**; *Hymedesmia (Hymedesmia) antarctica* **Boury-Esnault & van Beveren, 1982;** *Hymedesmia (Hymedesmia) gaussiana* **Hentschel, 1914**; *Hymedesmia (Hymedesmia) leptochela* **Hentschel, 1914**; *Hymedesmia (Stylopus) antarctica* **Hentschel, 1914**; *Hymedesmia (Stylopus) dermata var. antarctica* **Hentschel, 1914**; *Hymenancora rhaphidophora* **Hentschel, 1914**; *Hymeniacidon centrotyla* **Hentschel, 1914**; *Inflatella belli* **(Kirkpatrick, 1907)**; *Inflatella coelosphaeroides* **Koltun, 1964**; *Iophon aceratum* **Hentschel, 1914**; *Iophon gaussi* **Hentschel, 1914**; *Iophon unicorne* **Topsent, 1907**; *Iotroata somovi* **(Koltun, 1964)**; *Isodictya cavicornuta* **Dendy, 1924**; *Isodictya delicata* **(Thiele, 1905)**; *Isodictya delicata var. megachela* **Burton, 1934**; *Isodictya doryphora* **(Brøndsted, 1927)**; *Isodictya erinacea* **(Topsent, 1916)**; *Isodictya kerguelenensis* **(Ridley & Dendy, 1886)**; *Isodictya lankesteri* **(Kirkpatrick, 1907)**; *Isodictya obliquidens* **(Hentschel, 1914);** *Isodictya setifera* **(Topsent, 1901)**; *Jenkina articulata* **Brøndsted, 1931**; *Jenkina glabra* **Brøndsted, 1931**; *Jenkina hiberna* **(Jenkin, 1908)**; *Kirkpatrickia variolosa* **(Kirkpatrick, 1907)**; *Latrunculia (Latrunculia) apicalis* **Ridley & Dendy, 1886**; *Latrunculia (Latrunculia) basalis* **Kirkpatrick, 1908**; *Leucandra comata* **Brøndsted, 1931**; *Leucandra gausapata* **Brøndsted, 1931**; *Leucandra mawsoni* **Dendy, 1918**; *Leucascus leptoraphis* **(Jenkin, 1908)**; *Leucetta antarctica* **Dendy, 1918**; *Leucosolenia aboralis* **Brøndsted, 1931**; *Leucosolenia australis* **Brøndsted, 1931**; *Leucosolenia solida* **Brøndsted, 1931**; *Lissodendoryx (Ectyodoryx) anacantha* **(Hentschel, 1914)**; *Lissodendoryx (Ectyodoryx) antarctica* **(Hentschel, 1914)**; *Lissodendoryx (Ectyodoryx) plumosa* **(Hentschel, 1914)**; *Lissodendoryx (Ectyodoryx) ramilobosa* **(Topsent, 1916)**; *Lissodendoryx (Lissodendoryx) flabellata* **Burton, 1929**; *Lissodendoryx (Lissodendoryx) styloderma* **Hentschel, 1914**; *Megapogon crispatus* **Jenkin, 1908**; *Megapogon raripilus* **Jenkin, 1908**; *Microxina benedeni* **(Topsent, 1901)**; *Microxina phakellioides*

	(Kirkpatrick, 1907); *Mycale (Aegogropila) magellanica* **(Ridley, 1881)**; *Mycale (Carmia) gaussiana* **Hentschel, 1914**; *Mycale (Mycale) tridens* **Hentschel, 1914**; *Mycale (Oxymycale) acerata* **Kirkpatrick, 1907**; *Mycale profunda* **Koltun, 1964**; *Myxilla (Burtonanchora) asigmata* **(Topsent, 1901)**; *Myxilla (Burtonanchora) lissostyla* **Burton, 1938**; *Myxilla (Myxilla) insolens* **Koltun, 1964**; *Myxilla (Myxilla) mollis* **Ridley & Dendy, 1886**; *Myxodoryx hanitschi* **(Kirkpatrick, 1907)**; *Phelloderma radiatum* **Ridley & Dendy, 1886**; *Phorbas acanthochela* **(Koltun, 1964)**; *Phorbas glaberrimus* **(Topsent, 1917)**; *Phorbas nexus* **(Koltun, 1964)**; *Plakina monolopha var. antarctica* **Lendenfeld, 1907**; *Plakina trilopha var. antarctica* **Lendenfeld, 1907**; *Plicatellopsis antarctica* **(Carter, 1876)**; *Plicatellopsis fragilis* **Koltun, 1964**; *Plocamionida gaussiana* **(Hentschel, 1914)**; *Poecillastra compressa antarctica* **Koltun, 1964**; *Poecillastra schulzei* **(Sollas, 1886)**; *Polymastia invaginata* **Kirkpatrick, 1907**; *Polymastia invaginata var. gaussi* **Hentschel, 1914**; *Polymastia isidis* **Thiele, 1905**; *Proteleia burtoni* **Koltun, 1964**; *Pseudosuberites hyalinus* **(Ridley & Dendy, 1886)**; *Pseudosuberites nudus* **Koltun, 1964**; *Pyloderma latrunculioides* **(Ridley & Dendy, 1886)**; *Raspailia (Hymeraphiopsis) irregularis* **Hentschel, 1914**; *Rhizaxinella australiensis* **Hentschel, 1909**; *Rossella antarctica* **Carter, 1872**; *Rossella fibulata* **Schulze & Kirkpatrick, 1910**; *Rossella gaussi* **Schulze & Kirkpatrick, 1910**; *Rossella lychnophora* **Schulze & Kirkpatrick, 1910**; *Rossella mixta* **Schulze & Kirkpatrick, 1910**; *Rossella racovitzae* **Topsent, 1901**; *Rossella vanhoeffeni* **(Schulze & Kirkpatrick, 1910)**; *Rossella vanhoeffeni var. armata* **(Schulze & Kirkpatrick, 1910)**; *Rossella vanhoeffeni var. vanhoeffeni* **(Schulze & Kirkpatrick, 1910)**; *Rossella villosa* **Burton, 1929**; *Rossella vitiosa* **Wiedenmayer in Hooper & Wiedenmayer, 1994**; *Soleneiscus apicalis* **(Brøndsted, 1931)**; *Soleneiscus hispidus* **(Brøndsted, 1931)**; *Sphaerotylus antarcticus* **Kirkpatrick, 1907**; *Sphaerotylus antarcticus var. drygalskii* **Hentschel, 1914**; *Sphaerotylus vanhoeffeni* **Hentschel, 1914**; *Stelletta crater* **Dendy, 1924**; *Stylocordyla borealis var. irregularis* **Hentschel, 1914**; *Stylocordyla chupachups* **Uriz, Gili, Orejas & Perez-Porro, 2011**; *Suberites caminatus* **Ridley & Dendy, 1886**; *Suberites microstomus* **Ridley & Dendy, 1887**; *Suberites topsenti* **(Burton, 1929)**; *Sycantha longstaffi* **(Jenkin, 1908)**; *Sycetta antarctica* **(Brøndsted, 1931)**; *Sycon australe* **(Jenkin, 1908)**; *Tedania (Tedania) trirhaphis* **Koltun, 1964**; *Tedania (Tedaniopsis) charcoti* **Topsent, 1907**; *Tedania (Tedaniopsis) gracilis* **Hentschel, 1914**; *Tedania (Tedaniopsis) massa* **Ridley & Dendy, 1886**; *Tedania (Tedaniopsis) oxeata* **Topsent, 1916**; *Tedania (Tedaniopsis) vanhoeffeni* **Hentschel, 1914**; *Tethyopsis longispinus* **(Lendenfeld, 1907)**; *Tetilla leptoderma* **Sollas, 1886**
225.	East Antarctic Enderby Land Ecoregion (8) *Anoxycalyx (Anoxycalyx) ijimai* **Kirkpatrick, 1907**; *Anoxycalyx (Scolymastra) joubini* **(Topsent, 1916)**; *Caulophacus (Caulodiscus) valdiviae* **Schulze, 1904**; *Coelosphaera (Coelosphaera) antarctica* **Koltun, 1976**; *Isodictya erinacea* **(Topsent, 1916)**; *Rossella antarctica* **Carter, 1872**; *Rossella racovitzae* **Topsent, 1901**; *Rossella villosa* **Burton, 1929**
226.	East Antarctic Dronning Maud Land Ecoregion (7) *Anoxycalyx (Scolymastra) joubini* **(Topsent, 1916)**; *Cladorhiza mani* **Koltun, 1964**; *Clathria (Thalysias) ongulensis* **(Hoshino, 1977)**; *Isodictya echinata* **Thomas & Matthew, 1986**; *Rossella antarctica* **Carter, 1872**; *Rossella racovitzae* **Topsent, 1901**; *Rossella villosa* **Burton, 1929**
227.	Weddell Sea Ecoregion (71) *Acanthopolymastia acanthoxa* **(Koltun, 1964)**; *Anoxycalyx (Scolymastra) joubini* **(Topsent, 1916)**; *Aplysina minima* **Hentschel, 1914**; *Ascaltis abyssus* **Rapp, Janussen &**

	Tendal, 2011; *Astrotylus astrotylus* **Plotkin & Janussen, 2007**; *Axinella antarctica* **(Koltun, 1964)**; *Calyx arcuarius* **(Topsent, 1913)**; *Caulophacus (Caulodiscus) brandtae* **Janussen, Tabachnick & Tendal, 2004**; *Caulophacus (Caulophacus) discohexactinus* **Janussen, Tabachnick & Tendal, 2004**; *Caulophacus (Caulophacus) instabilis* **Topsent, 1910**; *Caulophacus (Caulophacus) scotiae* **Topsent, 1910**; *Caulophacus (Oxydiscus) weddelli* **Janussen, Tabachnick & Tendal, 2004**; *Chondrocladia (Chondrocladia) antarctica* **Hentschel, 1914**; *Cinachyra antarctica* **(Carter, 1872)**; *Cladocroce gaussiana* **(Hentschel, 1914)**; *Cladorhiza penniformis* **Göcke & Janussen, 2013**; *Clathria (Axosuberites) nidificata* **(Kirkpatrick, 1907)**; *Clathria (Clathria) pauper* **Brøndsted, 1927**; *Clathrina broendstedi* **Rapp, Janussen & Tendal, 2011**; *Cornulum antarcticum* **Göcke & Janussen, 2013**; *Crella (Pytheas) crassa* **(Hentschel, 1914)**; *Desmacella koltuni* **Göcke & Janussen, 2013**; *Esperiopsis scotiae* **Topsent, 1915**; *Halichondria (Halichondria) prostrata* **Thiele, 1905**; *Haliclona (Gellius) flagellifera* **(Ridley & Dendy, 1886)**; *Haliclona (Gellius) rudis* **(Topsent, 1901)**; *Haliclona (Gellius) tylotoxa* **(Hentschel, 1914)**; *Haliclona (Rhizoniera) dancoi* **(Topsent, 1913)**; *Hemigellius bidens* **(Topsent, 1901)**; *Hemigellius fimbriatus* **(Kirkpatrick, 1907)**; *Holascus obesus* **Schulze, 1904**; *Holascus pseudostellatus* **Janussen, Tabachnick & Tendal, 2004**; *Inflatella belli* **(Kirkpatrick, 1907)**; *Iophon unicorne* **Topsent, 1907**; *Isodictya doryphora* **(Brøndsted, 1927)**; *Isodictya kerguelenensis* **(Ridley & Dendy, 1886)**; *Isodictya setifera* **(Topsent, 1901)**; *Isodictya toxophila* **Burton, 1932**; *Leucetta weddelliana* **Rapp, Janussen & Tendal, 2011**; *Lissodendoryx (Ectyodoryx) ramilobosa* **(Topsent, 1916)**; *Lissodendoryx (Lissodendoryx) styloderma* **Hentschel, 1914**; *Lophocalyx profunda* **Janussen & Reiswig, 2009**; *Lophocalyx topsenti* **Janussen & Reiswig, 2009**; *Microxina benedeni* **(Topsent, 1901)**; *Mycale (Oxymycale) acerata* **Kirkpatrick, 1907**; *Myxilla (Burtonanchora) asigmata* **(Topsent, 1901)**; *Myxilla (Myxilla) insolens* **Koltun, 1964**; *Myxodoryx hanitschi* **(Kirkpatrick, 1907)**; *Periphragella antarctica* **Janussen, Tabachnick & Tendal, 2004**; *Phelloderma oxychaetoides* **Göcke, Hajdu & Janussen, 2014**; *Phorbas megasigma* **Rios & Cristobo, 2007**; *Polymastia invaginata* **Kirkpatrick, 1907**; *Polymastia zitteli* **(Lendenfeld, 1888)**; *Pseudosuberites hyalinus* **(Ridley & Dendy, 1886)**; *Pseudosuberites nudus* **Koltun, 1964**; *Pyloderma latrunculioides* **(Ridley & Dendy, 1886)**; *Raspailia (Hymeraphiopsis) irregularis* **Hentschel, 1914**; *Rossella antarctica* **Carter, 1872**; *Rossella fibulata* **Schulze & Kirkpatrick, 1910**; *Rossella levis* **(Kirkpatrick, 1907)**; *Rossella nuda* **Topsent, 1901**; *Rossella racovitzae* **Topsent, 1901**; *Rossella vanhoeffeni* **(Schulze & Kirkpatrick, 1910)**; *Rossella villosa* **Burton, 1929**; *Stylocordyla chupachups* **Uriz, Gili, Orejas & Perez-Porro, 2011**; *Suberites topsenti* **(Burton, 1929)**; *Tedania (Tedania) trirhaphis* **Koltun, 1964**; *Tedania (Tedaniopsis) charcoti* **Topsent, 1907**; *Tedania (Tedaniopsis) oxeata* **Topsent, 1916**; *Tedania (Tedaniopsis) tantula* **(Kirkpatrick, 1907)**; *Tetilla leptoderma* **Sollas, 1886**
228.	Amundsen/Bellingshausen Sea Ecoregion (excluded)
229.	Ross Sea Ecoregion (excluded)
Other	
	Vema Seamount (13) *Desmacidon clavatum* **Lévi, 1969**; *Echinodictyum macroxiphera* **Lévi, 1969**; *Eurypon fulvum* **Lévi, 1969**; *Gelliodes coscinopora* **Lévi, 1969**; *Haliclona (Reniera) alusiana* **(Lévi, 1969)**; *Mycale (Paresperella) curvisigma* **Lévi, 1969**; *Mycale diastrophochela* **Lévi, 1969**; *Oceanapia atlantica* **Lévi, 1969**; *Smenospongia nuda* **(Lévi, 1969)**; *Spongia (Spongia) brunnea* **Lévi, 1969**; *Spongia (Spongia) violacea* **Lévi, 1969**; *Strongylodesma areolata* **Lévi, 1969**; *Suberea pedunculata* **(Lévi, 1969)**