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Revealing hidden diversity: new *Latrunculia* and *Iophon* species (Porifera, Demospongiae, Poecilosclerida) from the continental shelf of the Namaqua ecoregion (Benguela ecosystem), along with a range extension of *Latrunculia (Aciculatrunculia) biformis*

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Abstract

Four new species of Poecilosclerida (Porifera, Demospongiae) assigned to the genera *Latrunculia* and *Iophon* are described from South Africa and Namibia, located in the Namaqua ecoregion. The Porifera occurring along the continental shelf within this ecoregion are relatively well-known, with 76 species formally described in previous literature. Of these, 35 species belong to the Order Poecilosclerida. Additionally, *Latrunculia* (*Aciculatrunculia*) *biformis* is reported from the continental shelf on the west coast of South Africa, extending its range further northwards into the South Atlantic. DNA barcoding and molecular phylogenetic analyses were employed to ensure accurate taxonomic assignment and designation of new species.

Introduction

Current knowledge of the sponge fauna at depths of 50–500 m within the Namaqua ecoregion of the Benguela ecosystem, which includes the continental shelf of Namibia and South Africa, is largely based on the works of Lévi (1963, 1967), Borojevic (1967), Uriz (1987, 1988), Samaai and Gibbons (2005), and Samaai et al (2018). In addition, a few species were described in the early part of the second half of the 19th century during the expeditions of the H.M.S. *Challenger* (Ridley and Dendy 1886, 1887; Sollas 1888) and *Valdivia* (Schulze 1904; Lendenfeld, 1907).

Although approximately 76 species have been recorded from the Namaqua ecoregion (de Voogd et al 2025), assessment of the literature reveals only brief descriptions, and many species are still awaiting discovery or (re)description. This is particularly true for the hundreds of new sponges collected along the shelf of the Namaqua ecoregion over the last 10 years during the research trawl surveys in South Africa by the Department of Forestry, Fisheries and the Environment (DFFE), and in Namibia by the Ministry of Fisheries and Marine Resources (Atkinson, 2009, Eisenbarth and Zettler 2016; Lange 2012; Lange and Griffiths 2014; Malan et al 2024; Mateus 2022). Offshore exploration, as well as diamond recovery, also enables the investigation of new areas on the Namaqua shelf, leading to the discovery of previously unknown sponge fauna in the region.

During the 2023 Debmarine Namibia Benthic Environmental Monitoring Programme, specimens of a green hemispherical latrunculid were found at a depth of 145 m offshore southern Namibia. In addition, a thinly interwoven branching *Iophon* species was collected from 139 m. This latter species was also detected during a recent DFFE research trawl survey, along with a second new *Iophon* and *Latrunculia* species.

In this paper, two new species of *Latrunculia* and two new species of *Iophon* collected from the shelf in the Namaqua ecoregion off the west coasts of South Africa and Namibia are described. Sequence data for the mitochondrial and nuclear barcoding genes, COI and 28S rRNA (C2–D2), are also provided where possible.

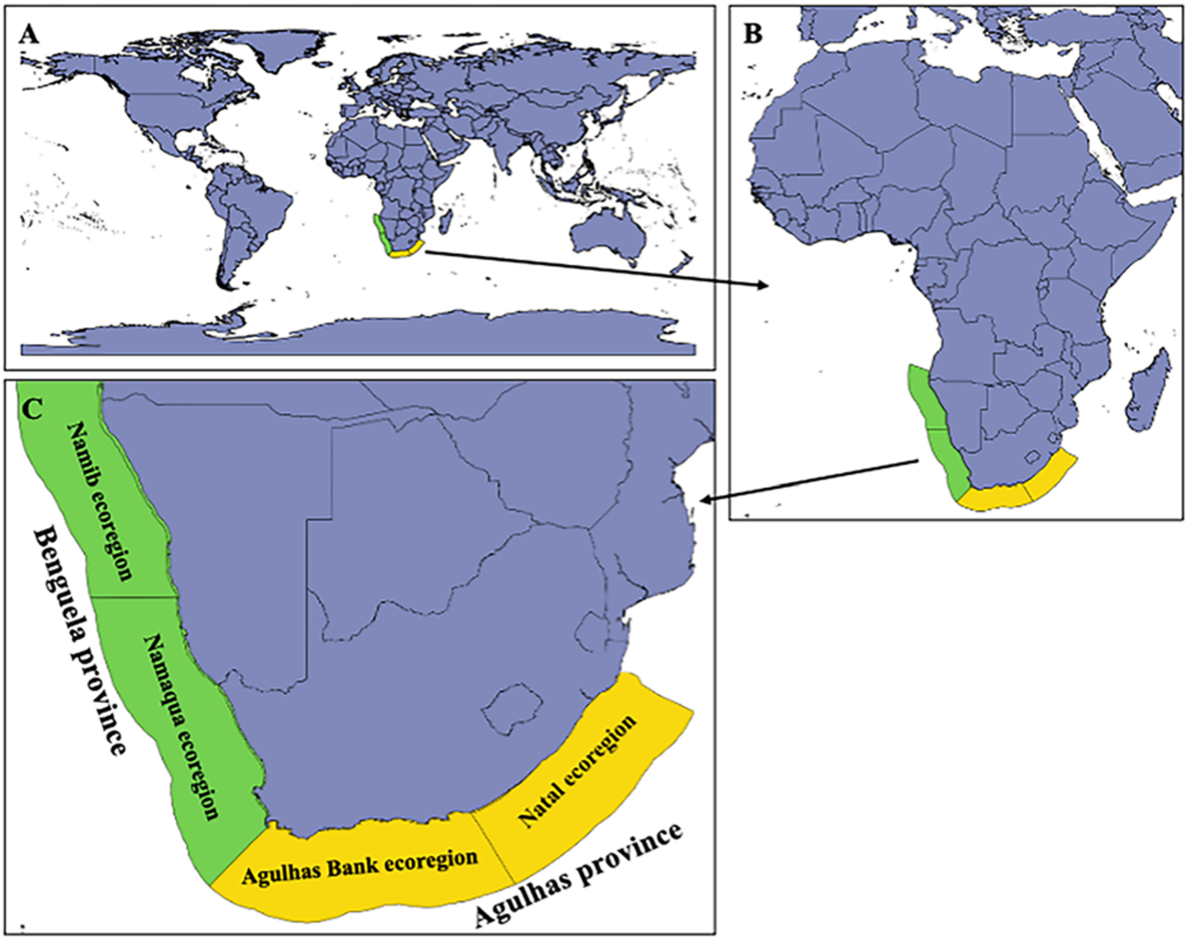

Figure 1. A map illustrating South Africa's position relative to other southern African countries and the world. B. The coloured polygon represents the temperate marine realm of southern Africa (Spalding et al., 2007). C. The green polygon highlights the Benguela province, which extends into southern Angola, along with the Namib and Namaqua ecoregions (Spalding et al., 2007). D. The yellow polygon outlines the Agulhas Bank and Natal ecoregions (Spalding et al., 2007).

Material and methods

Study area

For simplicity, we are using the marine ecoregion classification from Spalding et al (2007) and the bathymetry classification from Sink et al. (2019). The Namaqua ecoregion (west coast) (Figure 1) extends over 2000 km in length to the border of Angola and forms part of the Benguela province (Spalding et al 2007), which in turn forms the eastern boundary of the South Atlantic. It is recognized as a distinct biogeographical area (Spalding et al 2007; Sink et al., 2019). The Namaqua ecoregion can be divided into a northern region (between 15°S and 31°S) and a southern region (between 32°S and 34°S). The southern region has a Mediterranean-type climate (Shannon 1985), while the northern region is semi-arid to arid. This region, swept by the cold Benguela Current and frequently referred to as the Benguela Current Large Marine Ecosystem, is one of the four major upwelling systems and is among the most productive ecosystems in the world (Axelsen and Johnsen 2015; Hutchings et al 2009; Shannon 1985).

The prevailing winds along the west coast cause upwelling of cold, nutrient-rich water, which drives the high productivity of this region. Upwelling is particularly intense at a number of foci along the coast where wind stress is greatest, and the continental shelf is narrowest (Hutchings et al 2009). Upwelling is seasonal in the south, and extreme north, but perennial in the middle latitudes of the system. Temperatures range from 8°C to 14°C in summer, while surface waters up to 17°C reach the coast under the influence of north-westerly winds.

Sampling, preservation, and morphological analysis

Four sponge specimens were collected from the Atlantic 1 Mining Licence Area offshore of southern Namibia as part of the 2023 Debmarine Namibia Benthic Environmental Monitoring Programme. This extensive programme has been ongoing for at least two decades, and includes a yearly sampling campaign, with results detailed in a report by Anchor Environmental Consultants that currently comprises six discrete components (Mudbelt Natural Variability Study, Impact Monitoring Study V, SkiMonkey – monitoring of hard substrata, eDNA Metabarcoding, Water Quality Monitoring, and Species New to Science). Sampling was carried out aboard the vessel 'DP Star' by Anchor Environmental Consultants (Pty) Ltd with technical support from De Beers Marine GeoSurvey and Debmarine Namibia. Specimens were collected incidentally from two sites (CD/25/M, CD/39) using a Van Veen grab with a modified 'impact trigger mechanism' which samples an area of 0.2 m^2, and penetrates the sediment to a maximum depth of ~30 cm. In situ images were captured using a drop camera fitted with a high-definition underwater video camera.

South African sponge specimens were obtained from demersal research trawl surveys conducted annually on the FRS *Africana*. Trawl locations were determined in a pseudo-random manner

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across a depth range of 30–500 m (Atkinson et al 2011; Leslie and Fairweather 2008).

All specimens were preserved in 96% ethanol upon collection and prepared for histological examination as outlined in Samaai and Gibbons (2005). Spicule dimensions are given as the mean length (range of length measurements) × mean width (range of width measurements) of 25 measured spicules, unless otherwise stated. The skeleton sections were made by thick hand sections following protocols as outlined in Hooper (1996). Spicules were examined with a Carl Zeiss light microscope and a Desktop TM 4000 Scanning Electron Microscope.

DNA extraction, marker amplification, and phylogeny

DNA was extracted from specimens of *Latrunculia* and *Iophon* using an Omega EZNA Blood kit (Omega Bio-Tek) following an adapted version of the protocol provided by the manufacturer (overnight incubation in lysis buffer and proteinase K). Two independent molecular markers were amplified, namely COI and the C-region of 28S rRNA. The partial COI was amplified using the universal primers LCO1490 (5′-GGT CAA CAA ATC ATA AAG ATA TTG G-3′) and HCO2198 (5′-TAA ACT TCA GGG TGA CCA AAA AAT CA-3′) (Folmer et al 1994), and a fragment of 28S (C2–D2 region) was amplified using the primers C2 (5′-GAAAAGAACTTTGRARAGAGAGT-3′) and D2 (5′-TCCGTGTTTCAAGACGGG-3′) (Chombard et al 1998). C2–D2 region was selected because these were the most successful PCRs regarding 28S and have been known to be stable for all sponge classes, providing higher resolution and easier amplification (Chombard et al 1998). The COI was amplified using the following polymerase chain reaction (PCR) protocol: 30 seconds initial denaturation at 94°C, 40 cycles of 94°C for 30 seconds, 45°C for 30 seconds, and 72°C for 1 minute, followed by a final extension step at 72°C for 10 minutes. A different protocol was used for 28S: 2 minutes initial denaturation at 95°C, 40 cycles of 95°C for 30 seconds, 46°C for 30 seconds, and 68°C for 1 minute, followed by a final extension step at 68°C for 5 minutes.

PCRs were performed in volumes of 25 μl containing 12.5 μl Accuris Taq Master Mix (2 mM dNTPs and 6 mM $MgCl_2$), 1 μl Bovine Serum Albumin, 1 μl of each primer (10 μM in concentration), and 5 μl of purified DNA template.

PCR products were visualized on a 1.5% agarose gel via electrophoresis. Samples were sequenced at the Central Analytical Facility at Stellenbosch University using the forward and reverse primers mentioned above. Initial sequence processing (trimming), assembly, further processing and analysis was carried out in Geneious Prime 2025 (version 21.0.4+7-LTS) (https://www.geneious.com). Every assembly was manually inspected for intragenomic polymorphisms and suspected positions (double peaks) corrected with the respective IUPAC code. GenBank BLAST (Altschul et al 1990) was used to check for possible contamination and verify sponge sequences. Sequences were deposited in GenBank with the following accession numbers: PX591260 and PX591261 (28S rRNA), and PX526484 to PX526487 (COI). These sequences are listed for individual species under the subheading GenBank accession numbers.

Comparative COI and 28S sequences from other sponge species were sourced from the GenBank database, NCBI (https://www.ncbi.nlm.nih.gov/genbank/). The COI and 28S (C2 region) sequences generated in this study were aligned with published sequences using Clustal Omega (Sievers and Higgins 2014, 2021) as implemented in Geneious Prime (Kearse et al 2012), with species of *Halichondria* as the outgroup. RAxML 8.2.12 was used, with the GTR + G + I model (Stamatakis 2014) in Geneious Prime (v. 21.0.4+7-LTS) and 500 bootstrap iterations to execute maximum likelihood phylogenetic analyses. These trees were used to confirm that specimens were accurately identified, and in alignment with species having comparable sequences.

Registration of type and general material

Primary and secondary type materials are accessioned within the marine invertebrate collection at the Iziko South Africa Museum (ISAM) (formerly the South African Museum), Gardens, Cape Town (prefix SAMC-). The prefix SAM- is no longer used by the ISAM. Spicule slides are in the collection of the primary author, Toufiek Samaai (TS), housed at the Department of Forestry, Fisheries and the Environment, Oceans and Coasts Research (DFFE-OCR). Specimens housed in the latter collection are referred to by the prefix TS-.

Other materials examined are from the Natural History Museum, London (formerly known as the British Museum [Natural History]), using the prefix BMNH-; NIWA Invertebrate Collection at the National Institute of Water and Atmospheric Research (NIWA), (formerly New Zealand Oceanographic Institute, using the prefix NZOI-), Wellington; The Muséum national d'Histoire naturelle, Paris, using the prefix MNHN-; The Tasmanian Museum and Art Gallery, particularly for its zoological collection, using the prefix TS. The prefix MKB is for the personal collection of Dr Michelle Kelly (personal accession prefix MKB) at NIWA, Auckland.

ZooBank registration

This published work, along with the nomenclatural acts it contains (such as the creation of new species), has been registered in ZooBank (http://www.zoobank.org/), the official registry of Zoological Nomenclature. The ZooBank Life Science Identifier for this publication is urn:lsid:zoobank.org:pub:E76793E9-D586-431C-A5B1-B308E5058DFE. New scientific names and additional comments have also been registered in ZooBank; see the ZooBank number for species descriptions.

Taxonomic authority

The taxonomic authorities for new taxa described in this paper are restricted to primary taxonomists, Samaai and Payne, to reduce unwieldiness for future species name citations.

Results and discussion

Systematics

The taxonomic descriptions of four new demosponges from the Namaqua ecoregion, temperate southern Africa, are provided below. Classification follows the online World Porifera Database (de Voogd et al 2025), based on the Systema Porifera (Hooper and Van Soest 2002), with revision by Morrow and Cárdenas (2015).

Species descriptions

Phylum Porifera Grant, 1836

Class Demospongiae Sollas, 1885

Subclass Heteroscleromorpha Cárdenas, Pérez and Boury-Esnault, 2012

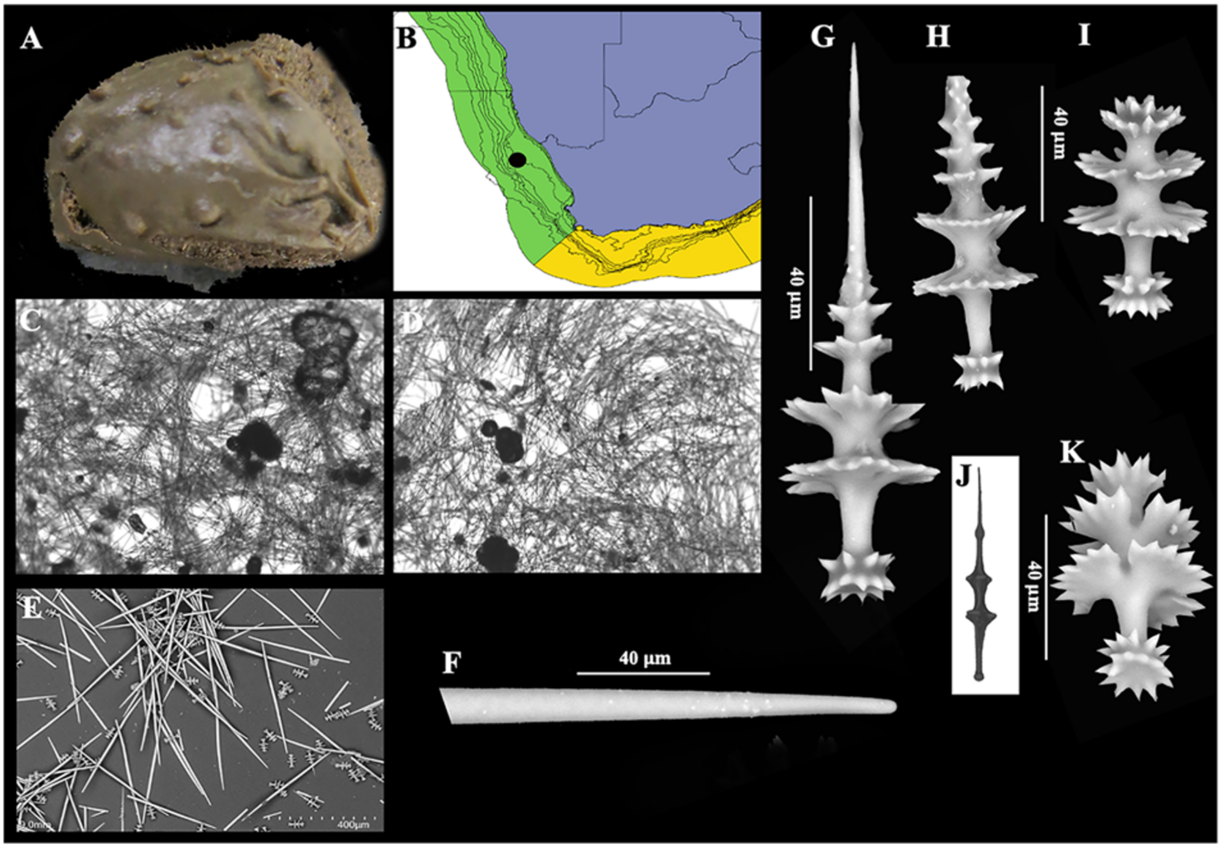

Figure 2. Latrunculia (Aciculatrunculia) biformis Kirkpatrick, 1908, morphology and distribution: A. SAMC–A099312 (cross ref. TS 1875), gross morphology of preserved holotype specimen; B. Distribution of specimen SAMC–A099312 (cross ref. TS 1875) examined in this study (black circles); C & D. Cross-section of the skeletal architecture, 10 x & 5 x magnifications; E. Spicule compliment of anisostyles, aciculodiscorhabds and anisodiscorhabs; F. part of the anisostyle showing the rounded and tapering end; G-J. Aciculodiscorhabds and anisodiscorhabds; J. Upside-down view of an anisodiscorhabd showing the manubrium; K. Immature aciculodiscorhabd.

Order Poecilosclerida Topsent, 1928
Family Latrunculiidae Topsent, 1922
Genus *Latrunculia* du Bocage, 1869

Type species. *Latrunculia cratera* du Bocage, 1869 represented as *Latrunculia (Latrunculia) cratera* du Bocage, 1869 (by monotypy) (lost).

Representative species. *Latrunculia bocagei* Ridley and Dendy, 1887: 238, PL. XLIV, FIG. 1, PL. XLV, FIG. 8, 8A (after Samaai and Kelly 2002).

Subgenus *Latrunculia (Aciculatrunculia)* Kelly and Sim-Smith, 2022

Diagnosis. *Latrunculia* species in which the microscleres are exclusively, or include, aciculodiscorhabds with attenuated apical spines of varying lengths. Anisodiscorhabds may or may not be present. Hypertrophied aciculodiscorhabds may be variably present; these range from an elongated aciculodiscorhabd to an aciculodiscorhabd-like ornamented acanthostyles (Sim-Smith et al 2022).

***Latrunculia (Aciculatrunculia) biformis* Kirkpatrick, 1908**
(Figure 2, Tables 1 and 2)

Synonyms

Latrunculia apicalis Ridley and Dendy, 1886: 492.

Latrunculia apicalis Ridley and Dendy, 1887: 239, pl. XLIV fig. 4, pl. XLV figs 9, 9A–C (in part, NHMUK 1887.5.2.84a).

Latrunculia apicalis var. *biformis* Kirkpatrick, 1908: 14, pl. XV figs 1–7; Burton, 1929: 444.

Latrunculia apicalis Koltun, 1964: 23, pl. IV figs 4–6; Koltun, 1976: 169; Boury-Esnault and Van Beveren, 1982: 42, figs 10c, d; Samaai et al, 2003: 6.

Latrunculia biformis Samaai et al, 2003: 6, figs 4A, 5A; Rios et al, 2004: 117–118, fig. 15; Rios,2006: 475, figs 249–252; Boury-Esnault and Van Beveren, 1982: 44, fig. 11.

Latrunculia (*Latrunculia*) *biformis* Samaai et al, 2006: 19, figs 1D, 2, 4C.

Material examined. SAMC–A099312 (cross ref. TS 1854): DFFE Demersal Research Trawl survey, South Africa west coast, Station A31464 (29.7261°S, 15.1501°E), 275 m depth, coll. FRS *Africana*, 6 February 2011.

South African material examined. SAM-H 4959 (cross ref. MK Harper 90-174, TS 19 and MKB 378) Rheeders Bay, Tsitsikamma National Park, South Africa, 34.0217°S, 23.9033°E, depth 28 m, shallow reef, coll. MKHarper (Smithkline Beecham Collection), SCUBA, 1995. BMNH1997.7.3.2 (cross ref. TS 1) Rheeders Bay, Tsitsikamma National Park, South Africa, 34.0217°S, 23.9033°E, depth 28 m, shallow reef, coll. MKHarper (Smithkline Beecham Collection), SCUBA, 1995.

Other material examined. Holotype. BMNH 1908.2.5.70 (microscope slide 1908.2.5.70a), labelled *L. apicalis* var. *biformis* by Kirkpatrick, Winter Quarters, Ross Sea, Antarctica, National Antarctic Expedition 1901-04, HMS *Discovery*, 18–27 m. **Paratypes.** BMNH 1908.2.5.69 b and c, labelled *L. apicalis* var. *biformis* by Kirkpatrick, Winter Quarters, Ross Sea, Antarctica, National Antarctic Expedition 1901-04, HMS *Discovery*, 18–27 m.

BMNH 1887.5.2.84a labelled *L. apicalis* (Type) identified by Ridley and Dendy, 1887, ethanol preserved sample and microscope-slides, off the mouth of Rio de la Plata, Argentina, 37° 17′S, 53° 52′W, depth 1080 m, *Challenger* Expedition, 14 February 1876. MNHM MD03 50D D.NBE 1388 labelled *L. apicalis* identified by Boury-Esnault in Boury-Esnault and Van Beveren, 1982, spicule slide only, NW of Kerguelen, Subantarctic region, stn 17, depth 585 m. NZOI stn A461 (cross ref. TS 50) unidentified sponge in NIWA collection, 73° 32.0′S; 171° 22′W, Antarctica, 564–553 m, coll. on the 18/01/1959. TS 15542 (cross ref. TS 461) labelled *L. apicalis* identified on the 26/01/1930, Banzare stn 42, Enderby Land, Antarctica, 65° 50.0′S; 54° 23′E, depth 220 m.

Type locality. Winter Quarters, Ross Sea, Antarctica.

Distribution. Rio de la Plata, Argentina; Kerguelen Islands, Southern Ocean; Antarctica; South Africa (west and south coasts).

Description (Figure 2a). Hemispherical form. Length 25 mm, width 20 mm, and thickness 15 mm. Ectosomal layer thin and transparent, distinguished from the underlying choanosome. Surface smooth with numerous raised conical oscules, 1 mm in diameter. Texture firm, resilient, and slightly fleshy. External colour in life green, in preservative light green/brown.

Skeleton (Figure 2c and d). Choanosomal skeleton comprises a dense polygonal-meshed reticulation formed by wispy tracts of smooth anisostyles. There is no distinction between the primary and secondary fibres. Towards the surface, these spicules tend to be vertically arranged. Ectosomal surface is lined with a layer of erect anisodiscorhabds.

Spiculation (Figure 2f–k). Megascleres. Anisostyles, smooth, centrally thickened, fusiform, and slightly sinuous: 462 (442–480) × 11 (11) μm, $n = 25$ (Figure 2f). **Microscleres.** In two categories (Figure 2g–k). Aciculodiscorhabds (Figure 2g), the manubrium short with a regular expanded spinose base, armoured with a basal whorl with a series of separate short spines, followed by a smooth, short, stout shaft. Median whorl is circular, broad, flat, and horizontally arranged with segments divided into six denticulate margins or spines, 45 μm in diameter, similar in diameter to the subsidiary whorl, slanting slightly upwards and divided into five denticulate margins. The spines of the apical whorl are reduced and slanted upwards, and protruding from the apex is an apical projection, which gradually tapers to a fine point. Aciculodiscorhabds: 134 (112–179) μm, $n = 25$. Anisodiscorhabd (Figure 2i and j) without apical projection, having four whorls of spines; median whorl circular, flat and horizontally arranged, divided into seven denticulate margins or spines, 45 μm in diameter. The subsidiary whorl is short, leaf-like, and slanted upwards, pointing towards the apical whorl and divided into six denticulate margins. Anisodiscorhabd: 73 (67–78) μm, $n = 25$.

Molecular data. Attempts to sequence this specimen for both the COI and 28S C2 region were unsuccessful.

Substratum, depth range, and ecology. The species were sampled from rariphotic, soft sediment habitat, including fine or unconsolidated sediments on the continental shelf, and occur in deep-sea communities beyond 500 m depth. In addition, they have been recorded on rocky substrata in shallow waters, with a depth range of 20–1379 m (Sim-Smith et al 2022).

Remarks. The genus *Latrunculia* is most commonly found in cold temperate waters. Currently, there are 13 fossil and 52 valid extant species that are assigned to *Latrunculia* du Bocage, 1869, which are classified into four subgenera: *Latrunculia* (*Latrunculia*) du Bocage, 1869; *Latrunculia* (*Aciculatrunculia*) Kelly and Sim-Smith, 2022; *Latrunculia* (*Biannulata*) Samaai, Gibbons, and Kelly, 2006; and *Latrunculia* (*Uniannulata*) Kelly, Reiswig, and Samaai, 2016 (de Voogd et al 2025). The majority of species belong to the subgenus *Latrunculia* (*Latrunculia*), while most species in *Latrunculia* (*Biannulata*) and all species in *Latrunculia* (*Aciculatrunculia*) originate from the Southern Hemisphere. Among these, *L.* (*A.*) *biformis* Kirkpatrick, 1908, is the most commonly collected latrunculid species in Antarctic waters and the Southern Ocean. It is easily identifiable by its unique combination of aciculodiscorhabds and anisodiscorhabds in the spicule complement. As noted by Samaai et al (2006), this species exhibits significant variation in the dimension of anisostyle, anisodiscorhabd and aciculodiscorhabd (see also Table 1). *Latrunculia* (*A.*) *biformis* was first recorded at a shallow depth (28 m) in South Africa's Tsitsikamma by Samaai et al (2003).

During a routine demersal research trawl survey conducted by the DFFE, a specimen of *L.* (*A.*) *biformis* was collected from deep water at a depth of 275 m in the Namaqua ecoregion on South Africa's west coast (Table 1). This represents the furthest recorded range extension of the species in the South Atlantic, as its primary distribution hotspot remains around Antarctica.

The Namaqua specimen exhibits some of the largest recorded aciculodiscorhabds and anisodiscorhabds in terms of length (Table 1; also compare measurements in Table 3, Samaai et al 2006).

Notably, its discorhabds exceed those of the Tsitsikamma specimen from South Africa's south coast (Anisodiscorhabds: 65 [55–72] × 7.2 μm; Aciculodiscorhabds: 102 [82–137] × 7.2 μm). However, the Tsitsikamma specimen has a second category of aciculodiscorhabd that is hypertrophied and measures 245 μm in length.

Additionally, unlike the shallow-water Tsitsikamma specimen, the west coast specimen lacks hypertrophied aciculodiscorhabds, a spicule type also observed in specimens from New Zealand and Antarctica (Sim-Smith et al 2022).

As previously highlighted by Samaai et al (2006) and Sim-Smith et al (2022), *L.* (*A.*) *biformis* displays considerable variation in the dimensions of anisodiscorhabd and aciculodiscorhabd, as well as in the structural characteristics of the aciculodiscorhabd (see Table 1; also refer to Table 19 in Sim-Smith et al 2022 and Table 3, Samaai et al 2006).

Key diagnostic characters

- hemispherical to globular form
- densely covered in raised conical oscules
- aciculodiscorhabds in addition to anisodiscorhabds
- sometimes hypertrophied aciculodiscorhabds present.

Subgenus *Latrunculia* (*Latrunculia*) du Bocage, 1869

Diagnosis. Latrunculia species in which the anisodiscorhabd microscleres have three distinct whorls of projections around the shaft, the median, subsidiary, and basal whorls, that lie between the apical whorl and manubrium. An apex or apical spine is present in some species but is fused with the apical whorl in other species (taken from Sim-Smith et al [2022], modified from Samaai et al [2006] and Kelly et al [2016]).

Latrunculia (Latrunculia) namaquaensis **Samaai and Payne sp. nov.**

(Figure 3, Tables 1 and 2)

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Material examined. Holotype. SAMC–A099314 (cross ref. TS 6651, CD/25/M/23): 2023 Debmarine Namibia Benthic

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Table 1. Comparison of species of the genus *Latrunculia* du Bocage, 1869 from South Africa. All spicule measurements are in µm. Ecoregions according to Spalding et al (2007)

Species	Catalogue number	Ecoregion(s)	Distribution	Depth (m)	Gross morphology	Colour	Styles	Anisodicorhabds	Aciculodiscorhabds
L. (A.) biformis Kirkpatrick, 1908	Holotype (BMNH 1908.2.5.70)	Ross Sea (Agulhas Bank, Namaqua, Ross Sea, Kerguelen Islands, Rio de la Plata)	Argentina; Kerguelen Islands, Southern Ocean; Antarctica; South Africa (west and south coasts)	18–27 (20–1379)	Massive and conical, with a broad base	Colour in life chocolate brown	473 (436–482) × 11	57 (50–60) × 6.9 × 35	72 (62–83) × 7 × 23
L. (A.) biformis Kirkpatrick, 1908	SAMC–A099312 (cross ref. TS 1875)	Namaqua (Agulhas Bank, Ross Sea, Kerguelen Islands, Rio de la Plata)	Argentina; Kerguelen Islands, Southern Ocean; Antarctica; South Africa (west and south coasts)	275 (20–1379)	Hemispherical form, with numerous raised conical oscules	Colour in life green, in preservative light green/brown	462 (442–480) × 11 (11) µm	73 (67–78) µm	134 (112–179) µm
L. (A.) biformis Kirkpatrick, 1908	SAM H–4959 (cross ref. TS 19 and MKB 378)	Agulhas Bank, (Namaqua, Ross Sea, Kerguelen Islands, Rio de la Plata)	Argentina; Kerguelen Islands, Southern Ocean; Antarctica; South Africa (west and south coasts)	28 (20–1379)	Hemispherical to globular sponge, with raised conical oscules on surface	Colour in life mottled chocolate brown, interior dark chocolate brown, in preservative dark chocolate brown	558 (528–576) × 12 (12–16) µm	65 (55–72) × 7 µm	Aciculodiscorhabd I 102 (82–137) × 7 µm Aciculodiscorhabd II 245 (200–260) × 7 µm
***L. (L.) namaquaensis* Samaai and Payne** sp. nov.	SAMC–XXXX (cross ref. TS 6651)	Namaqua	Off Southern Namibia	145	Small, hemispherical form with numerous volcano-shaped oscules	Dark green	383 (347–414) × 9 (7–9) µm	42 (40–46) × 7 (5–9) µm	
***L. (L.) atkinsonae* Samaai and Payne** sp. nov.	SAMC–XXXX (cross ref. TS 6568)	Namaqua	South Africa, West Coast	133	Medium size, semi-hemispherical form with minute areolate porefields, and volcano-shaped or conical oscules	Unknown in life, dark chocolate brown in preservative	410 (384–432) × 10 (8–11) µm	47 (43–48) × 29 (29) µm	
***L. (B.) lunaviridis* Samaai and Kelly, 2003**	BMNH 1996.7.3.6 (fragment SAM H–4960, SAM H–4961)	Namaqua	Southern Benguela, Oudekraal to Hout Bay, South Africa, West Coast	17–32	Hemispherical with thick-rimmed oscules and crater-shaped porefields	Pale olive green	357 (336–384) × 12 µm	54 (53–60) µm	

(*Continued*)

Table 1. (*Continued.*)

Species	Catalogue number	Ecoregion(s)	Distribution	Depth (m)	Gross morphology	Colour	Styles	Anisodicorhabds	Aciculodiscorhabds
***L. (B.) microacanthoxea* Samaai and Kelly, 2003**	BMNH 1996.7.3.1 (fragment SAM H–4962)	Agulhas Bank	Tsitsikamma National Park, South Coast South Africa	28	Hemispherical with thick-rimmed oscules and crater-shaped porefields	Olive green	397 (374–422) × 10 μm	55 (50–60) μm	
L. (B.) gotzi Samaai, Janson, and Kelly, 2012	SAM-A24718	Agulhas Bank	Alphard Banks, South Coast South Africa	41	Hemispherical with broad meandering areolate pore-fields and simple membranous oscules	Mahogany brown (pore-fields light cork brown)	319 (288–346) × 10 (7–12) μm	49 (48–53) μm	
L. (B.) kerwathi Samaai, Janson, and Kelly, 2012	SAM-A24719	Agulhas Bank	45-Mile Banks, South Coast, South Africa	85	Thin encrusting form with tiny raised aquiferous structures	Dark greenish brown	367 (346–394) × 11 (10–12) μm	53 (48–55) μm	
L. (B.) algoaensis Samaai, Janson, and Kelly, 2012	SAM-A24720 (RU-510-3)	Agulhas Bank	Algoa Bay, East Coast, South Africa	22–30	Thickly encrusting to hemispherical form with thick-lipped, circular areolate porefields	Green	369 (326–384) × 11 (10–12) μm	48 (46–50) μm	

Table 2. Comparison of species of the genus *Latrunculia* (*Latrunculia*) du Bocage, 1869. All spicule measurements are in μm

Species	Holotype catalogue number/reference	Distribution	Depth (m)	Gross morphology	Colour	Styles	Anisodicorhabds	Spicule image
***L. (L.) namaquaensis* Samaai and Payne** sp. nov.	SAMC–A099314 (cross ref. TS 6651)	Off Southern Namibia	145	Small, hemispherical form with numerous volcano-shaped oscules	Dark green	383 (347–414) × 9 (7–9) μm	42 (40–46) × 7 (5–9) μm	
***L. (L.) atkinsonae* Samaai and Payne** sp. nov.	SAMC–A099313 (cross ref. TS 6568)	South Africa, West Coast	133	Medium size, semi-hemispherical form with minute areolate porefields, and volcano-shaped or conical oscules	Unknown in life, dark chocolate brown in preservative	410 (384–432) × 10 (8–11) μm	47 (43–48) × 29 (29) μm	
L. (L.) bocagei Ridley and Dendy, 1886	NHMUK 1887.5.2.237 (see Sim-Smith et al 2022)	Kergeulen Island, Falkland Island, Balleney Island, Antarctica	18–992 m	Hemispherical to cushion-shaped sponge densely covered with numerous short, conical or cylindrical fistules	Colour in life dark brown to deep olive green, colour of holotype in preservative tan to pale yellow	513 (434–564) × 11 (8–18) μm (*n* = 101)	64 (55–72) × 36 (27–42) μm	
L. (L.) basalis Kirkpatrick, 1908	BMNH 1908.2.5.72 (see Sim-Smith et al 2022)	Balleney Island, Antarctica	462 m	Cake-shaped, several discoidal, raised pore areas and one conical papilla is present	Colour is light brown in preservative	554 (500–592) × 16 (16) μm	69 (69) × 34 μm	
***L. (L.) lendenfeldi* Hentschel, 1914**	ZMB 4812 (see Sim-Smith et al 2022)	Antarctica	203–415 m	Sponge with flaky surface; cushion-shaped and covered with numerous long volcano-shaped fistules	Colour in life is deep olive green, colour in ethanol is dark brown	567 (415–637) × 12 (10–14) μm	71 (65–80) × 41 (30–48) μm	

(*Continued*)

Table 2. (*Continued.*)

Species	Holotype catalogue number/reference	Distribution	Depth (m)	Gross morphology	Colour	Styles	Anisodicorhabds	Spicule image
L. (L.) brevis Ridley and Dendy, 1886	NHMUK 1887.5.2.270 (microscope slides) (see Sim-Smith et al 2022)	Rio de la Plata, Argentina-Uruguay; Antarctica; Macquarie Ridge (Australia and New Zealand EEZ); Chatham Islands and Northland, New Zealand	168–1658 m	Thickly encrusting, massive or hemispherical sponge	Colour in life unknown, colour in preservative tan to yellowish grey	492 (389–600) × 11 (6–16) µm	52 (38–70) × 32 (21–41) µm	
Latrunculia (Latrunculia) fiordensis **Alvarez, Bergquist and Battershill, 2002**	NIWA 7601 (see Sim-Smith et al 2022)	Doubtful Sound, Fiordland, New Zealand	8–30 m	Massive or globular sponge	Olive green in life, dark brown in alcohol	330 (258–400) × 6 (3–9) µm	38 (30–47) × 14 (10–19) µm	
Latrunculia (Latrunculia) triverticillata **Alvarez, Bergquist and Battershill, 2002**	NIWA 7789 (see Sim-Smith et al 2022)	Kaikoura; Chatham Islands, New Zealand	8–396 m	Massive globular sponge	Dark brown in life and in alcohol	337 (241–415) × 6 (3–9) µm	38 (31–49) × 15 (10–21) µm	
L. (L.) toufieki **Kelly and Sim-Smith, 2022**	NIWA 39321 (see Sim-Smith et al 2022)	Admiralty Seamount, Ross Sea, Antarctica	479–480 m	Very thinly encrusting sponge growing on rock	Unknown	424 (355–460) × 12 (7–19) µm	65 (58–72) × 36 (31–43) µm	
L. (L.) nelumbo **Kelly and Sim-Smith, 2022**	NHMUK 1887.5.2.269 (microscope slides) (see Sim-Smith et al 2022)	Rio de la Plata, Argentina-Uruguay; Antarctica; Macquarie Ridge (NZ EEZ), Gisborne Knolls, New Zealand	158–2700 m	Thickly encrusting or massive sponge	Colour in life, moss green, colour in preservative dark brown	486 (414–550) × 10 (6–14) µm	57 (46–68) × 35 (27–41) µm	

(*Continued*)

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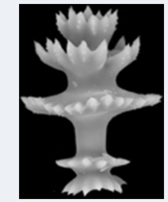
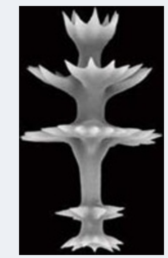
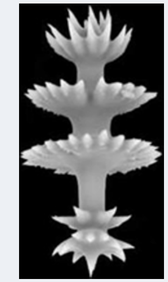
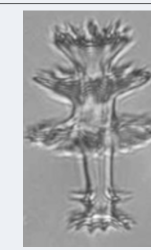
Table 2. (*Continued.*)

Species	Holotype catalogue number/reference	Distribution	Depth (m)	Gross morphology	Colour	Styles	Anisodicorhabds	Spicule image
***L. (L.) morrisoni* Kelly and Sim-Smith, 2022**	NIWA 49096 (see Sim-Smith et al 2022)	Mile Beach, Northland, New Zealand	992–1028 m	Massive sponge	Colour in life unknown, colour in alcohol is dark brown	507 (449–544) × 10 (7–13) µm	41 (38–44) × 30 (24–34) µm	
***Latrunculia (Latrunculia) gracilis* Kelly and Sim-Smith, 2022**	NIWA 74781 (see Sim-Smith et al 2022)	Dunedin and Auckland Islands	197–215 m	Massive to thickly encrusting sponge	Colour in life unknown, colour in alcohol medium to dark brown	389 (328–465) × 7 (4–9) µm	48 (43–57) × 30 (18–29) µm	
***L. (L.) prendens* Kelly and Sim-Smith, 2022**	QM G339776 (see Sim-Smith et al 2022)	Seamount 7, Macquarie Ridge (Australia EEZ)	770–1014 m	Small, thinly encrusting sponge	Colour in life unknown, colour in alcohol tan	516 (472–569) × 12 (9–15) µm	47 (43–51) × 31 (27–35) µm	
***Latrunculia (Latrunculia) robertsoni* Kelly and Sim-Smith, 2022**	NIWA 44855 (see Sim-Smith et al 2022)	West and east coasts of New Zealand	218–492 m	Massive, densely covered in narrow, tapered	Colour in life images dull light brown, colour in alcohol is medium to dark brown	503 (359–608) × 11 (5–18) µm	57 (44–71) × 28 (22–36) µm	

(*Continued*)

Table 2. (*Continued.*)

Species	Holotype catalogue number/reference	Distribution	Depth (m)	Gross morphology	Colour	Styles	Anisodicorhabds	Spicule image
***Latrunculia (Latrunculia) kiwi* Kelly and Sim-Smith, 2022**	NIWA 126008 (see Sim-Smith et al 2022)	Kiwi Seamount, Three Kings Ridge (International Waters)	759 m	Small, growing around a dead coral branch	Colour in life dark brown, colour in ethanol is medium brown	596 (546–662) × 13 (11–17) µm	61 (55–67) × 30 (24–36) µm	
***Latrunculia (Latrunculia) incristata* Kelly and Sim-Smith, 2022**	NIWA 90986 (see Sim-Smith et al 2022)	Southern Norfolk Ridge, New Zealand	1228–1332 m	Tiny fragment of a thinly encrusting sponge, which was entirely consumed by the spicule preparations	Unknown	485 (444–532) × 15 (11–18) µm	61 (56–67) × 35 (30–42) µm	
***L. (L.) magistra* Kelly and Sim-Smith, 2022**	NIWA 143571 (see Sim-Smith et al 2022)	East of Three Kings Islands, New Zealand	54–108 m	Small fragment of an encrusting sponge	Unknown	333 (290–376) µm long × 10 (7–13) µm	56 (50–63) µm × 33 (26–38) µm	
***Latrunculia (Latrunculia) andeepi* Kelly and Sim-Smith, 2022**	SMF 10591 (see Sim-Smith et al 2022)	Weddell Sea, Antarctica	2618 m	Encrusting sponge	Colour in life unknown, colour in ethanol light greyish brown	575 (540–610) × 11 (10–18) µm	70 (63–78) × 41 (38–45) µm	

(*Continued*)

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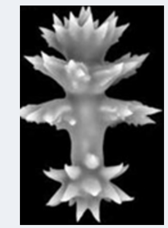
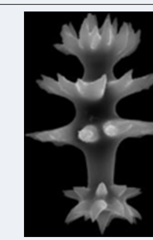
Table 2. (*Continued.*)

Species	Holotype catalogue number/reference	Distribution	Depth (m)	Gross morphology	Colour	Styles	Anisodicorhabds	Spicule image
L. (L.) bransfieldi **Kelly and Sim-Smith, 2022**	SMF 11191 (see Sim-Smith et al 2022)	Bransfield Strait, Antarctic Peninsula, Antarctica	580 m	Thickly encrusting	Colour in life olive green, colour in ethanol black	485 (460–510) × 10 (10–10) µm	76 (69–83) × 26 (25–28) µm	
L. (L.) variornata **Kelly and Sim-Smith, 2022**	NIWA 52208 (see Sim-Smith et al 2022)	Myall Islands, Cosmonauts Sea, Antarctica	25–289 m	Thickly encrusting, cushion-shaped, with numerous papillae (1 mm high)covering the surface	Colour in life dark green, colour in ethanol is black	468 (366–530) × 8 (5–11) µm	47 (38–64) × 31 (28–33) µm	
Latrunculia (Latrunculia) austini Samaai, Gibbons, and Kelly, 2006	RBCM 982-62-1	British Columbia	20–50 m	Spherical sponge	Colour in life is brownish grey to purple brown	376 (335–402) µm × 9 (8–11) µm	58 (51–64) mm	
L. (L.) ciruela **Hajdu, Desqueyroux-Faúndez, Carvalho, Lôbo-Hajdu, and Willenz, 2013**	IZUA-POR 145	Chilean Patagonia	19–29 m	Globular sponge	Colour is deep-purple, brownish purple or dark-green, becoming dark brown in ethanol	265–400 × 3–12 µmOxeas 300–500 × 5–10 µm	35–50 × 18–33 µm	
Latrunculia (Latrunculia) copihuensis **Hajdu, Desqueyroux-Faúndez, Carvalho, Lôbo-Hajdu, and Willenz, 2013**	RBINSc-IG 32233-POR 9915	Chilean Patagonia	23 m	Globular sponge	Colour is dark-green, becoming dark-brown in ethanol	285–386 × 3–9 µmOxeas 285–405 × 3–6 µm	34–42 × 14–26 µm	

(*Continued*)

Table 2. (*Continued.*)

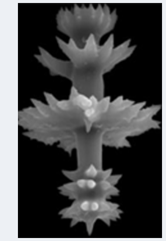
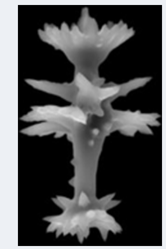
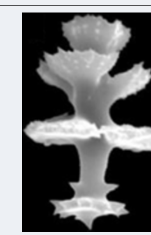
Species	Holotype catalogue number/reference	Distribution	Depth (m)	Gross morphology	Colour	Styles	Anisodicorhabds	Spicule image
***Latrunculia (Latrunculia) verenae* Hajdu, Desqueyroux-Faúndez, Carvalho, Lôbo-Hajdu, and Willenz, 2013**	IZUA-POR 146	Chilean Patagonia	28–30 m	Globular sponge	Colour is dull-green, becoming brown or dark brown in ethanol	311–400 × 5–12 µm	38–50 × 14–33 µm	
***Latrunculia (Latrunculia) yepayek* Hajdu, Desqueyroux-Faúndez, Carvalho, Lôbo-Hajdu, and Willenz, 2013**	RBINSc-IG 32233-POR 9940	Chilean Patagonia	16 m	Globular-ovoid sponge	Colour in life dark purplish-brown, in ethanol slightly faded	268–360 × 4–10 µmOxeas 280–420 × 2–8 µm	38–43 × 19–26 µmSanidaster-like anisodis-corhabds 42–46 × 13–20 µm	
***Latrunculia (Latrunculia) hamanni* Kelly, Reiswig, and Samaai, 2016**	RBCM 015-00480-001	North Pacific Ocean, from Kiska Island to Umnak Island in the Aleutian Islands, including Petrel Bank, which extends into the Bering Sea	80–300 m	Hemispherical to spherical sponge	Colour in life is dark chocolate to purplish brown	492 (442–545) × 13 (8–15) µm	48 (40–55) µm	
***Latrunculia (Latrunculia) palmata* Lévi, 1964**	L.B.I.M. No D.CL. 1390	Mindanao, Philippines	1500 m	Sponge small semispherical to pyriform	Colour in life unknown; in preservative dark brown	394 (382–410) × 8–9 µm	57 (53–58) µm	
***Latrunculia (Latrunculia) ikematsui* Tanita, 1968**	NSMT PO 11	Korea; Japan	Depth unknown	Small, semispherical sponge	Colour in life darkish purple; in preservative dark chocolate brown	300 (280–320) × 7 (6.5–8) µm	38(32–38) µm	

Table 3. Comparison of species of the genus *Iophon* Gray, 1867 from Southern Africa. All spicule measurements are in µm

Species	Catalogue number	Ecoregion	Distribution	Depth (m)	Gross morphology	Colour	Large acanthostyles	Small acanthostyles	Tylostrongyles	Bipocilli	Palmate anisochelae
***I. gibbonsi* Samaai and Payne** sp. nov.	SAMC–A099317 (cross ref. TS 6573)	Namaqua	Southern Namibia to Northern South Africa	78–139	Branching, with branches thin and inter-linked, from a common stalk	Whitish beige	236 (213–269) × 9 (8–10)	123 (107–138) × 8 (6–9)	162 (144–174) × 4 (3–5)	16 (14–18)	19 (16–25)
***I. jansonae* Samaai and Payne** sp. nov.	SAMC–A099316 (cross ref. TS 6560)	Namaqua	South Africa, West Coast, Southern Benguela	380	Thickly encrusting	In life unknown, in preser-vative dark chocolate brown	368 (364–386) × 17 (17)	333 (286–364) × 8 (8)	275 (263–286) × 6 (6)	I. 28 (28)II. 17 (17)	I. 58 (50–67)II. 30 (28–34)
I. abnormalis Ridley and Dendy, 1886	BMNH 1887.5.2.159	Prince Edward Island	Marion Island, Southern Ocean	91–128	Branching, cylindrical	Black	350 × 13		280 × 8		I. 38II. 19
I. cheliferum Ridley and Dendy, 1886	BMNH 1887.5.2.116	Namaqua	Southern Benguela, Cape of Good Hope, South Africa (also recorded from Prince Edward and Kerguelen Islands – Southern Ocean)	275 (622–1005)	Massive, hon-eycombed	Light brown to black	400 × 20		300 × 10	19	19–30 (two size categories)
I. cheliferum Ridley and Dendy, 1886 **sensu** Uriz, 1988	Specimen no. B–33	Namaqua	Southern Benguela, South Africa, West Coast	260–269	Enveloping the branches of a hydroid	Tan in preservative	260–320 × 15–20		205–270 × 6–8	I. 10–12II. 14–18	24–33 × 11–15

(*Continued*)

Table 3. (*Continued.*)

Species	Catalogue number	Ecoregion	Distribution	Depth (m)	Gross morphology	Colour	Large acanthostyles	Small acanthostyles	Tylostrongyles	Bipocilli	Palmate anisochelae
I. cheliferum Ridley and Dendy, 1886 **sensu** Boury-Esnault and Van Beveren, 1982		Kerguelen Islands,	Kerguelen Islands, Southern Ocean	200–500	Massive, blade shape	Orange (turns black in preservative)	313 (286–331) × 17 (13–20)		265 (234–279) × 7 (6–10)		I. 32 (25–34)II. 18 (15–22)
I. proximum Ridley, 1881	BMNH 1879.12.27.5	Channels and Fjords of Southern Chile	Chile	12–18	Encrusting	Dark brown	158 × 9.5		158 × 8	10	25
I. proximum Ridley, 1881 **sensu** Uriz, 1988	Specimens 7B-15, 6B-103, 7B-104	Namaqua	Namibia	232–322	Irregular, massive or thickly encrusting	Dark brown	200–250 × 8–12	90–110 × 4–8	175–200 × 2–4	10 × 14	I. 19–25II. 12–14
I. proximum Ridley, 1881 **sensu** Samaai and Gibbons, 2005	SAM-H4914 (TS 495)	Namaqua	Southern Benguela, Ouderkraal, Cape Town, South Africa West Coast. Also recorded from Oranjemund and Lüderitz (Namibia)	15 (27 and 78)	Encrusting	Brown to orange	133 (122–151) × 12 (12)		121 (106–129) × 2 (2)	12 (12)	23 (23–25)
Iophon hentscheli **Van Soest, 2024**	ZMB 4607	Kerguelen Islands	Kerguelen Islands, Southern Ocean	380–385	Large, hand-shaped	Dark brown	416–704		256–400	5–20 (probably two size categories)	I. 35II. 17–25

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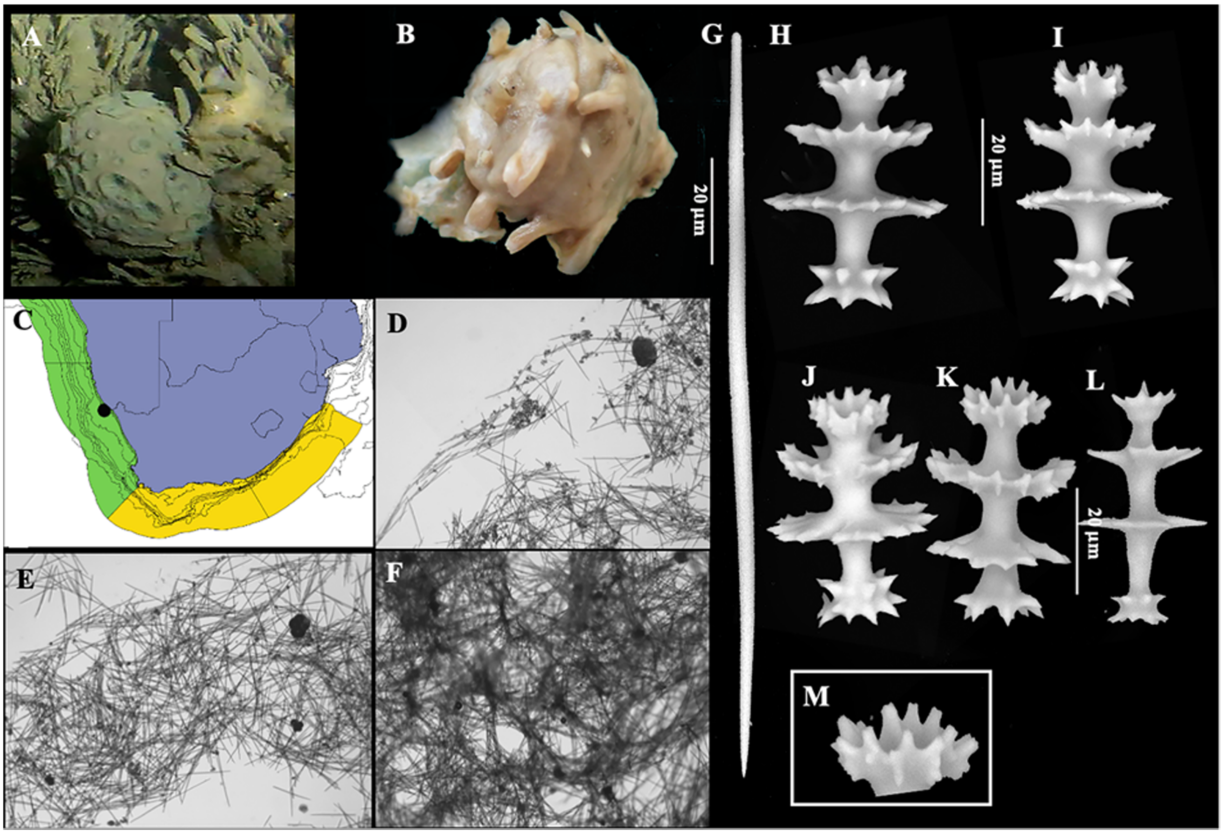

Figure 3. Latrunculia (Latrunculia) namaquaensis Samaai & Payne sp. nov., morphology and distribution: A. Holotype SAMC–A099314 (cross ref. TS6651), in situ image; B. Holotype SAMC–A099314 (cross ref. TS6651), preserved specimen; C. Distribution and type locality (black circle) of Latrunculia (Biannulata) namaquaensis sp. nov.; D, E, F. Skeletal cross-section of holotype (cross ref. TS6651), 5 x, 5x & 10 x magnifications; D. Paratangential layer of the extosome; E, F. Choanosomal skeleton comprises a dense polygonal-meshed reticulation, 5x & 10 x magnifications; G. Anisostyle from holotype; H-M. Anisodiscorhabds of holotype SAMC–A099314 (cross ref. TS6651); N. Close-up of the apical whorl of an anisodiscorhabd showing the terminally spined apical whorl.

Environmental Monitoring Programme, Atlantic 1 Mining Licence Area, southern Namibia, Site CD/25 (28.6523°S, 15.8313°E), 145 m depth, coll. R. Payne (Anchor Environmental Consultants) on *DP Star*, Van Veen Grab, 17 November 2023.

Paratype. SAMC–A099315 (cross ref. TS 6652, CD/25/M/23): 2023 Debmarine Namibia Benthic Environmental Monitoring Programme, Atlantic 1 Mining Licence Area, southern Namibia, Site CD/25 (28.6523°S, 15.8313°E), 145 m depth, coll. R. Payne (Anchor Environmental Consultants) on *DP Star*, Van Veen Grab, 17 November 2023.

Etymology. Named after the type locality (Namaqua ecoregion).

Type locality (Figure 3c). Southern Namibia, Namaqua ecoregion.

Distribution (Figure 3c). Southern Namibia, Namaqua ecoregion.

Description (Figure 3a and b). Small, hemispherical form. Length 30 mm, width 20 mm, and thickness 14 mm. Surface smooth, slightly hispid, and sandpapery, with numerous volcano-shaped oscules, 2–4 mm high, 1 mm wide at apex, 3 mm wide at surface, and 1 mm in diameter. Ostia (or areolate porefields) not visible in preserved samples. Texture firm but soft and spongy. Compressible and easily torn. Ectosome very thin and transparent, 0.2 mm thick and not easily separable from the underlying choanosome. External colour in life dark green, in preservative light brown/beige. All living specimens gave off a red exudate when placed in ethanol.

Skeleton (Figure 3d–f). Choanosomal skeleton comprises a dense polygonal-meshed reticulation formed by wispy tracts of smooth anisostyles (Figure 3e and f). There is no distinction between the primary and secondary fibres. Towards the surface, these spicules tend to be vertically arranged, and just beneath the ectosome, the spicules are tangentially arranged (Figure 3d). Ectosomal surface is lined with a layer of erect anisodiscorhabds.

Spiculation (Figure 3g–n). Megascleres. Anisostyles, small, smooth, slightly sinuous and fusiform: 383 (347–414) × 9 (7–9) µm, n = 25 (Figure 3g). **Microscleres.** Anisodiscorhabds: 42 (40–46) µm length × 28 (24–30) µm whorl width, with a slender shaft 7 (5–9) µm, $n = 25$ (Figure 3h–m). The apical whorl is a cluster of upward-pointing, mostly vertical blunt spines, with fine spination on the top (Figure 3n). Subsidiary whorl located a third away from the apical whorl and very slightly upturned, while the median whorl is horizontal with a very straight margin. The subsidiary and median whorls are approximately the same diameter (28 µm) and divided into several segments with shallow notched margins, which are slightly spined. The segments of both the subsidiary and medium whorls each have four whorls of spines; median whorl more circular, flat, and horizontally arranged. The basal whorl is a horizontal ring of separated conical spines located just above the manubrium.

GenBank accession numbers. COI PX526487; 28S PX591260 and PX591261.

Molecular data. The origin of our sequences as Porifera was confirmed by a BLAST search, thereby ruling out the possibility of contamination. We successfully sequenced both the 28S rRNA and COI for *L. (L.) namaquaensis* sp. nov. The 28S sequences were generated for both the holotype (SAMC–A099314) and paratype (SAMC–A099315), while the COI was sequenced only for the holotype (SAMC–A099314). In both the COI and 28S phylogenies, *L. (L.) namaquaensis* sp. nov. is nested within a well-supported Latrunculiidae clade (Figure 7a and b).

The pair-wise sequence divergence (uncorrected p-distance) between *L. (L.) namaquaensis* sp. nov. and *Latrunculia (Biannulata) lunaviridis* Samaai and Kelly, 2003 (KC869489.1) for 28S was 0.6%. In contrast, the divergence between *L. (L.) namaquaensis* sp. nov. and *Tsitsikamma pedunculata* (KC869512.1) for 28S was 10% (see Supplementary Table S1 – uncorrected distance matrix).

For COI, pair-wise sequence divergence (uncorrected p-distance) between *L. (L.) namaquaensis* sp. nov. *Tsitsikamma favus* (KC471495.1) and *Sceptrella biannulata* (KF017195.1) was 5% and 6%, respectively. The COI phylogeny for the *Latrunculia* clade is well-supported with strong bootstrap support, and *L. (L.) namaquaensis* sp. nov. and *Latrunculia (Latrunculia) atkinsonae* sp. nov. are sister taxa (Figure 7b). The phylogenetic reconstruction also supports the monophyly of the *Latrunculia* species (Figure 7) and Latrunculiidae.

The COI genetic distances found between *Latrunculia* species and within the Family Latrunculiidae are in accordance with values previously found for other sponge species (see Supplementary Table S2).

Substratum, depth range, and ecology. The species was collected from a mesophotic, mixed habitats composed of sandy and rocky substrates, at a depth of 145 m.

Remarks. The anisodiscorhabds of the new species closely resemble those of *Latrunculia* (*Latrunculia*) species, featuring three distinct whorls of projections around the shaft: the median, subsidiary, and basal whorls, which are situated between the apical whorl and the manubrium.

Globally, thirty valid species of *Latrunculia* (*Latrunculia*) have been described (de Voogd et al 2025), primarily from deep-water environments, with the highest diversity found in the Southern Hemisphere (see Table 2) (de Voogd et al 2025; Kelly et al 2016; Sim-Smith et al 2022) around New Zealand and Antarctica. No species of *Latrunculia* (*Latrunculia*) has been recorded from temperate southern Africa, particularly South Africa. Most species belong to the subgenus *Biannulata* and are found in shallow waters at depths of less than 100 m. These species include *Latrunculia (Biannulata) algoaensis* Samaai, Janson, and Kelly, 2012, *Latrunculia (Biannulata) gotzi* Samaai, Janson, and Kelly, 2012, *Latrunculia (Biannulata) kerwathi* Samaai, Janson, and Kelly, 2012, *L. (B.) lunaviridis* Samaai and Kelly, 2003, and *Latrunculia (Biannulata) microacanthoxea* Samaai and Kelly, 2003 (Table 1). The new species differs from South African *Latrunculia* in its anisodiscorhabd structure, possessing a basal whorl and occurring at depths greater than 100 m (Figure 8a–g). *Latrunculia* (*Latrunculia*) *namaquaensis* sp. nov. is the first mesophotic deep-water shelf species described from the Namaqua ecoregion and is assigned to the subgenus *Latrunculia*. It was found in a mixed sand and rocky habitat on the continental shelf of the Namaqua ecoregion.

The apex of the apical whorl in the new species consists of a cluster of upward-pointing, predominantly vertical blunt spines, which are finely spined on top (Figure 3m). Four species of *Latrunculia* (*Latrunculia*) from the Southern Hemisphere also feature an apex with blunt spines: *Latrunculia (Latrunculia) bocagei* Ridley and Dendy, 1886, *Latrunculia (Latrunculia) lendenfeldi* Hentschel, 1914, *Latrunculia (Latrunculia) toufieki* Kelly and Sim-Smith, 2022, and *Latrunculia (Latrunculia) bransfieldi* Kelly and Sim-Smith, 2022.

Latrunculia (Latrunculia) basalis Kirkpatrick, 1908, on the other hand, has an apical whorl characterized by a bulbous cluster of smooth, slightly curved, pointed spines (Figure 8h–l). The structure of the spined apex (Figure 8i) and the clear separation of the apex from the apical whorl (Figure 8i), along with the presence of large styles, anisodiscorhabds and one conical papilla in *L. (L.) basalis* (Table 2), distinctly differentiate it from *L.* (*L.*) *namaquaensis* sp. nov.

The anisodiscorhabd of *L. (L.) bocagei* is characterized by a broad apical whorl and an apex composed of blunt, curling spines that are laterally serrated. The apical whorl is clearly separated from the subsidiary whorl beneath it. In contrast, the anisodiscorhabd of *L. (L.) namaquaensis* sp. nov. also shows a distinct separation between the apical and subsidiary whorls; however, the apex appears continuous with the apical whorl, lacking a clear demarcation (Figure 8a and h). The spicules of *L. (L.) bocagei* are substantially larger than those of *L. (L.) namaquaensis* sp. nov. (Table 2). The apex of *L. (L.) namaquaensis* sp. nov. bears vertical blunt spines with fine spination at the tip, in contrast to the laterally serrated, blunt, and curling spines observed in *L. (L.) bocagei* (see Figure 6F in Sim-Smith et al 2022).

Although the anisodiscorhabds of *L. (L.) lendenfeldi* and *L. (L.) namaquaensis* sp. nov. both possess an apex bearing chiaster-like, blunt, finger-shaped spines, they differ in several respects. The styles and anisodiscorhabds of *L. (L.) lendenfeldi* are larger than those of *L. (L.) namaquaensis* sp. nov. (Table 2). In *L. (L.) lendenfeldi*, the subsidiary whorl is sharply angled away from the shaft and closely appressed to the apical whorl, whereas in *L. (L.) namaquaensis* sp. nov., the subsidiary whorl is clearly separated from the apical whorl (Figure 8a and j).

Latrunculia (Latrunculia) toufieki differs from *L. (L.) namaquaensis* sp. nov. by having larger anisodiscorhabds (Table 2), and an apex composed of a fused ring of blunt, sculptured spines (Figure 8k), in contrast to the cluster of chiaster-like, blunt, finger-shaped spines seen in *L. (L.) namaquaensis* sp. nov. The subsidiary whorl in *L. (L.) toufieki* is also positioned very close to the apical whorl, giving the appearance of being part of the apical substructure, similar to that observed in *L. (L.) lendenfeldi*.

Latrunculia (Latrunculia) bransfieldi possesses the largest anisodiscorhabds among the known *Latrunculia (Latrunculia)* species (Table 2; see also Sim-Smith et al 2022). In addition to their size, the anisodiscorhabds of *L. (L.) bransfieldi* exhibit markedly different morphology (Figure 8a and l). The apical and subsidiary whorls display a distinctive wavy, petal-shaped ornamentation (Figure 8l), whereas in *L. (L.) namaquaensis* sp. nov., the whorls bear a simpler ornamentation comprising blunt, finger-like spines with terminal spination.

Uriz (1988) described a specimen of *Latrunculia* collected during the Benguela V survey at a depth of 183 m from southern Namibia as *Latrunculia brevis*. Samaai et al (2006) synonymized *L. brevis sensu* Uriz, 1988 with *L. (L.) basalis* Kirkpatrick, 1908. However, Sim-Smith et al (2022) disagree with the action taken by Samaai et al (2006). Sim-Smith et al (2022) justified their findings by noting that *L. brevis sensu* Uriz, 1988: 49, Figure 25 from Namibia has markedly smaller anisostyles (400 [340–430] μm) and anisodiscorhabds (56 [48–58] μm) compared to the holotype of *L. (L.) basalis* (554 [500–592] μm; 69 μm). The current authors agree with the findings of Sim-Smith et al (2022), and the correct

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assignment of *L. brevis sensu* Uriz, 1988 will require further specimen examination and research. It currently remains unidentified. Nevertheless, based on the published description, the anisostyles and anisodiscorhabds of Uriz (1988) *Latrunculia* specimens are larger, and the gross morphology also differs from that of the above material.

Key diagnostic characters

- small hemispherical form
- covered in volcano-shaped oscules
- medium-sized anisostyles, 383 (347–414) μm long
- small anisodiscorhabds, 42 (40–46) μm long
- apex has blunt spines, finely spined on top
- clear separation between the apical and subsidiary whorls.

Latrunculia (Latrunculia) atkinsonae **Samaai and Payne sp. nov.** (Figure 4, Table 1)

urn:lsid:zoobank.org:act:9D83A92D-D3DD-475B-A19A-229CD58477BB

Material examined. Holotype. SAMC–A099313 (cross ref. TS 6568): DFFE Demersal Research Trawl survey, South Africa west coast, Station A35085 (29.3620°S, 16.5312°E), 133 m depth, coll. FRS *Africana*, 07 March 2024.

Etymology. Named in honour of Dr Lara Atkinson, a marine benthic ecologist at SAEON, who has been monitoring invertebrate bycatch from DFFE demersal research trawl surveys for over a decade. Her team has contributed numerous sponge specimens to the TS DFFE sponge collection.

Type locality (Figure 4c). West coast of South Africa, Namaqua ecoregion.

Distribution (Figure 4c). Currently only known from west coast of South African, Namaqua ecoregion.

Description (Figure 4a and b). Medium size, semi-hemispherical form. Length 35 mm, width 25 mm, and thickness 12 mm. Surface smooth, but undulating, with minute areolate porefield, 0.5 mm in diameter. Volcano-shaped or conical oscules visible, 1 mm in diameter. Texture dense and firm. Ectosome thin and attached to choanosome, not easily separable, 0.2 mm thick. External colour in life unknown, in preservative dark chocolate brown.

Skeleton (Figure 4d–f). Choanosomal skeleton comprises a dense polygonal-meshed reticulation formed by wispy tracts of smooth anisostyles. There is no distinction between the primary and secondary fibres. Towards the surface, these spicules tend to be vertically arranged. Ectosomal surface is lined with a layer of erect anisodiscorhabds (Figure 4f).

Spiculation (Figure 4g–m). Megascleres. Anisostyles smooth, centrally thickened, fusiform and slightly sinuous: 410 (384–432) × 10 (8–11) μm diameter, $n = 25$ (Figure 4g). **Microscleres.** Anisodiscorhabds: 47 (43–48) × 29 (29) μm diameter, $n = 25$ (Figure 4h–k). Morphology of the apical whorl is shallow bowl-shaped with a slightly flattened base and short spines (Figure 4l). The apex is a cluster of short, vertical spines, sometimes with a single spine or bifurcated spine in the centre of the apical whorl. Subsidiary whorl located a third away from the apical whorl by a short shaft and slightly upturned, while the median whorl is horizontal with a straight margin. The subsidiary and median whorls are approximately the same diameter and divided into several segments with sharply notched margins (Figure 4m). Both the subsidiary and medium whorls have six whorls of spines each. The basal whorl has a slightly upward curved ring of conical spines, located just above the manubrium (Figure 4n).

GenBank accession numbers. COI PX526486.

Molecular data. The origin of our COI sequence as Porifera was confirmed by a BLAST search, thereby ruling out the possibility of contamination. We managed to sequence only the COI for the holotype (SAMC–A099313) of *L. (L.) atkinsonae* sp. nov. We were unable to generate a 28S sequence for *L. (L.) atkinsonae* sp. nov. The COI sequence data produced from holotype SAMC–A099313 were sister to *L. (L.) namaquaensis* sp. nov., within a clade containing all the other species of Latrunculiidae (Figure 7b).

Pair-wise sequence divergence (uncorrected p-distance) between *L. (L.) atkinsonae* sp. nov. and *L. (L.) namaquaensis* sp. nov. for COI was 0.5%. In contrast, the divergence between *L. (L.) atkinsonae* sp. nov., *Latrunculia (Aciculolatrunculia) biformis* (LN850209.1), and *Latrunculia (Latrunculia) brevis* (LN850236.1) was 0.4%. The divergences between *L. (L.) atkinsonae* sp. nov. and *S. biannulata* (KF017195.1), between *T. favus* (KC471495.1) and *L. (L.) atkinsonae* sp. nov., and between *S. biannulata* (KF017195.1) and *T. favus* (KC471495.1) were 6%, 5%, and 4%, respectively (see Supplementary Table S1 – uncorrected distance matrix).

The COI genetic distances found between *Latrunculia* species and within the Family Latrunculiidae are in accordance with values previously found for other sponge species (see Supplementary Table S2).

Substratum, depth range, and ecology. This species was found at a depth of 133 meters in mesophotic, unconsolidated soft-sediment habitat. It appears to be rare, as these are the first specimens recorded since sponge collections began in 2007 during the DFFE annual research trawl surveys.

Remarks. Although the COI molecular data indicate that *L. (L.) atkinsonae* sp. nov. is similar to *L. (L.) namaquaensis* sp. nov., the former species differs in its external morphology, having a larger anisodiscorhabd microscleres and in the structure of the apical whorl and apex. In *L. (L.) namaquaensis* sp. nov., the apex is made up of blunt spines, finely spined on top, while in *L. (L.) atkinsonae* sp. nov., **t**he apex is a cluster of short, vertical spines, sometimes with a single spine or bifurcated spine in the centre of the apical whorl. The structure of the apical whorls also varies (compare Figure 8b and m–t).

Table 2 briefly summarizes the descriptive information available for species of *Latrunculia* (*Latrunculia*) hitherto recorded from the Temperate Southern Africa, Temperate South America, Temperate Northern Pacific, Temperate Australasia, and Southern Ocean realms for comparative purposes. *L. (L.) atkinsonae* sp. nov. has similar-sized spicules to *L. (L.) brevis* Ridley and Dendy, 1886, *Latrunculia (Latrunculia) morrisoni* Kelly and Sim-Smith, 2022, *Latrunculia (Latrunculia) prendens* Kelly and Sim-Smith, 2022, *Latrunculia (Latrunculia) variornata* Kelly and Sim-Smith, 2022; *Latrunculia (Latrunculia) ciruela* Hajdu, Desqueyroux-Faúndez, Carvalho, Lôbo-Hajdu, and Willenz, 2013, *Latrunculia (Latrunculia) magistra* Kelly and Sim-Smith, 2022, and *Latrunculia (Latrunculia) nelumbo* Kelly and Sim-Smith 2022 (Table 2; Figure 8m–t).

It can be easily separated by anisodiscorhabd morphology from all, as they have distinctive anisodiscorhabds, with the exception of *L.* (*L.*) *brevis* (Figure 8m–t). The anisodiscorhabds of *L. (L.) atkinsonae* sp. nov. are similar looking to *L. (L.) nelumbo, L. (L.) brevis, L. (L.) magistra, L. (L.) morrisoni*, and *L. (L.) variornata*, but those of *L. (L.) atkinsonae* sp. nov. are more regular with fewer spines per segment and larger separations between the segments of the median and subsidiary whorls.

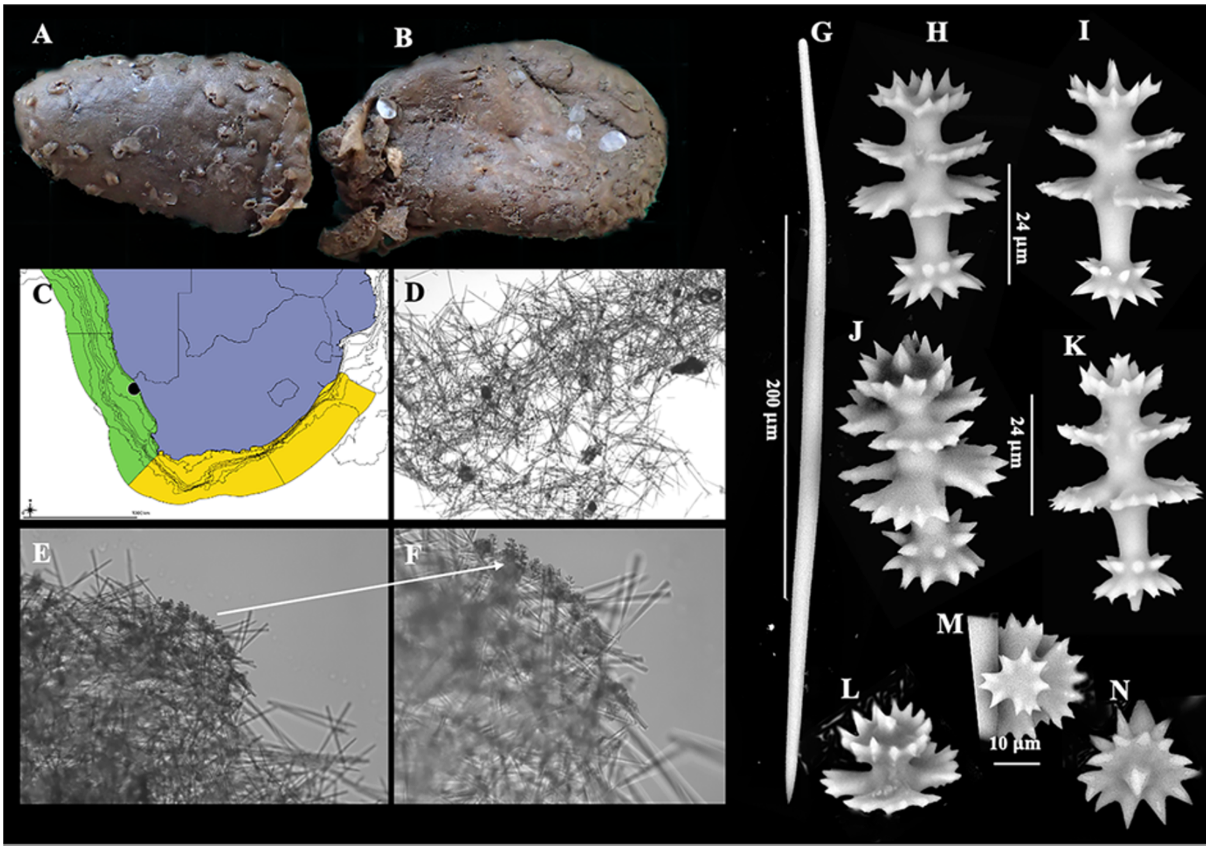

Figure 4. Latrunculia (Latrunculia) atkinsonae Samaai & Payne sp. nov., morphology and distribution: A & B. Holotype SAMC–A099313 (cross ref. TS 6568), preserved specimen; C. Distribution and type locality (black circle) of Latrunculia (Latrunculia) atkinsonae sp. nov.; D, E. Cross-section of the choanosome of SAMC–A099313 (cross ref. TS 6568), 5 x, 10x & 20 x magnifications; F. Cross-section of the ectosome of SAMC–XXXX showing the palisade of discorhabds at the surface; G. Anisostyle from holotype; H-K. Anisodiscorhabds of holotype SAMC–A099313; M, N, L. Close-up of the apical whorl (M & L) and manubrium (N) of an anisodiscorhabd. A small spike is visible in the center of the manubrium.

Latrunculia (Latrunculia) atkinsonae sp. nov. has anisodiscorhabds with an apical whorl that has a shallow bowl-shaped structure with a slightly flattened base with short spines, as opposed to being tulip shaped with a rounded base to funnel shaped and an apex having a cluster of long, vertical spines as in *L.(L.) brevis. Latrunculia (Latrunculia) brevis* also has larger anisostyles (Table 2; see also Sim-Smith et al 2022). The same comparison is visible when we compare the *Latrunculia (Latrunculia)* species to *L. (L.) atkinsonae* sp. nov.

Key diagnostic characters

- semi-hemispherical form
- covered in minute areolate porefield and slender, cylindrical, or volcano-shaped fistules
- ectosome thin and attached to choanosome, not easily separable
- small anisostyles, 410 (384–432) µm long
- moderate anisodiscorhabds, 47 (43–48) µm long.

Family Acarnidae Dendy, 1922

Genus *Iophon* Gray, 1867

Type species. *Halichondria scandens* Bowerbank, 1866 represented as *Iophon nigricans* Bowerbank, 1858 (by original designation).

***Iophon gibbonsi* Samaai and Payne sp. nov.**

(Figure 5, Table 2)

urn:lsid:zoobank.org:act:22251427-2A16-4714-BA5A-2B19A66C975F

Material examined. Holotype. SAMC–A099317 (cross ref. TS 6573): DFFE Demersal Research Trawl survey, South Africa west coast, Station A35074 (31.13125°S, 17.44705°E), 138 m depth, coll. FRS *Africana*, 04 March 2024.

Paratypes. SAMC–A099318 (cross ref. TS 6653, CD/39/23h): 2023 Debmarine Namibia Benthic Environmental Monitoring Programme, Atlantic 1 Mining Licence Area, southern Namibia, Site CD/39 (28.6815°S, 15.9079°E), 139 m depth, coll. R. Payne (Anchor Environmental Consultants) on *DP Star*, Van Veen Grab, 17 November 2023. SAMC–A099319 (cross ref. TS 6654, CD/39/23): 2023 Debmarine Namibia Benthic Environmental Monitoring Programme, Atlantic 1 Mining Licence Area, southern Namibia, Site CD/39 (28.6815°S, 15.9079°E), 139 m depth, coll. R. Payne (Anchor Environmental Consultants) on *DP Star*, Van Veen Grab, 17 November 2023.

Other material examined. SAM-H4914 (cross reference TS 527) and SAM-H4914 (cross reference TS 528): only spicule and histology slides available. Oranjemund, southern Namibia, 26.5167°S; 15°E, 78 m depth, coll. A. Goosen, JAGO submersible, 13 November 1998.

Etymology. Named in honour of Prof. Mark J. Gibbons of the University of the Western Cape (South Africa), in recognition of his significant contribution to biological oceanography, ecology, and conservation within the Namaqua ecoregion. He has mentored numerous students in marine invertebrate taxonomy and biodiversity and is regarded as a pioneering figure in modern marine biology in South Africa.

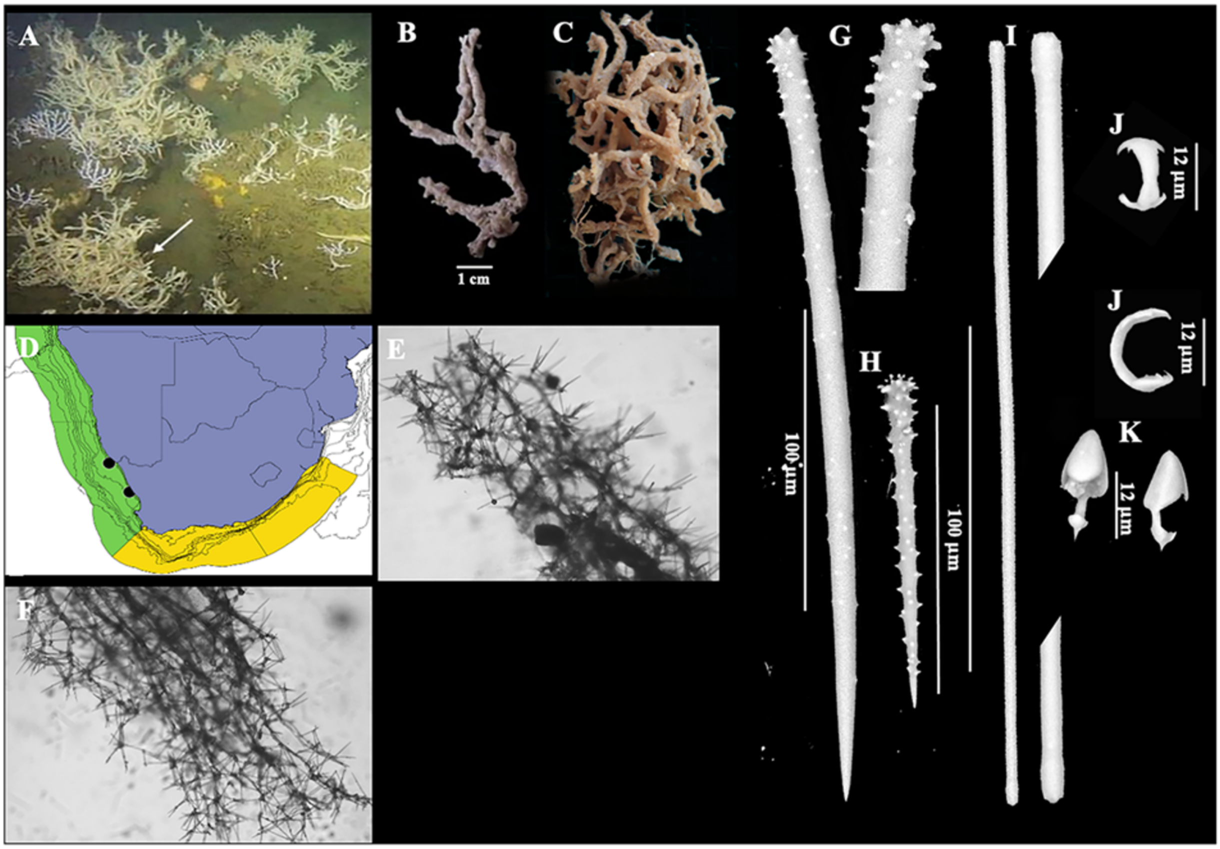

Figure 5. Iophon gibbonsi Samaai & Payne sp. nov., morphology and distribution: A. in situ image; B. Holotype SAMC–A099317 (cross ref. TS 6573), preserved specimen; C. Paratype SAMC–A099318 (cross ref. TS 6653, preserved specimen; D. Distribution and type locality (black circle, southern Namibia) of Iophon gibbonsi sp. nov.; E, F. Cross-section of the choanosome of Holotype SAMC–A099317 (cross ref. TS 6573), 5 x & 10x magnifications; G. Large acanthostyles from holotype SAMC–A099317; H. Small acanthostyles from holotype SAMC–A099317; I. Terminally spined acanthotylostrongyles of holotype SAMC–A099317; J. Bipocilli from holotype SAMC–A099317; K. Palmate anisochelae from holotype SAMC–A099317.

Type locality (Figure 5d). Southern Namibia, Namaqua ecoregion.

Distribution (Figure 5d). Southern Namibia and west coast of South African, Namaqua ecoregion.

Description (Figure 5a–c). Branching form, with thin branches interlinked and arising from a common stalk of length 15 mm and diameter 5 mm. Branches of length 70 mm, width 50 mm, and diameter 3–5 mm. Surface smooth and velvety, with numerous small oscules (∼0.2–0.5 mm in diameter) evenly scattered over surface. Surface occasionally coarse with calcareous inclusions. Texture fragile, soft, and compressible. Colour in situ whitish beige; in preservative ranges from light beige/brown (specimens TS 6653 and TS 6654) to dark chocolate or caramel brown (specimen TS 6573).

Skeleton (Figure 5e and f). Choanosomal skeleton comprises an isodictyal, uni- or paucispicular reticulation of acanthostyles, with little spongin, and small echinating acanthostyles. Ectosomal skeleton comprises stout brushes of acanthotylostrongyles, which ascend to surface and support dermal membrane. Microscleres scattered throughout choanosome.

Spiculation (Figure 5g–k). Megascleres. Acanthostyles, large, with spination prominent on top quarter: 236 (213–269) × 9 (8–10) µm, $n = 25$ (Figure 5g). Acanthostyles, reduced, heavily spined throughout: 123 (107–138) × 8 (6–9) µm, $n = 25$ (Figure 5h). Acanthotylostrongyles, with terminally spined ends: 162 (144–174) × 4 (3–5) µm, $n = 25$ (Figure 5i). **Microscleres.** Bipocilli: 16 (14–18) µm, $n = 25$ (Figure 5j). Palmate anisochelae with medial spur: 19 (16–25) µm, $n = 25$ (Figure 5k).

GenBank accession numbers. COI PX526484.

Molecular data. We managed to sequence only the COI for the holotype SAMC–A099317 of *I. gibbonsi* sp. nov. We were unable to generate a 28S sequence for any of the *I. gibbonsi* sp. nov. specimens. The specimens underwent two different DNA extractions and multiple amplification attempts with various deviations from the PCR protocol, but amplification success could not be achieved. The origin of our COI sequence as Porifera was confirmed by a BLAST search, ruling out the possibility of contamination. The COI sequence data produced from holotype SAMC–A099317 were well su orted within a clade containing other *Iophon* species (Figure 7b). Pair-wise sequence divergence (uncorrected p-distance) between *I. gibbonsi* sp. nov. and *Iophon jansonae* sp. nov. for COI was 5%.

The COI genetic distances found between *Iophon* species are in accordance with values previously found for other sponge species (see Supplementary Table S2).

Substratum, depth range, and ecology. The species was collected from a mesophotic, mixed habitats composed of sandy and rocky substrates, at a depth of 78–139 m, where it forms dense aggregations.

Remarks. The above material is assigned to *Iophon* as diagnosed by the presence of microscleres comprising bipocilli and palmate anisochelae with spurs (Hooper 2002), even though

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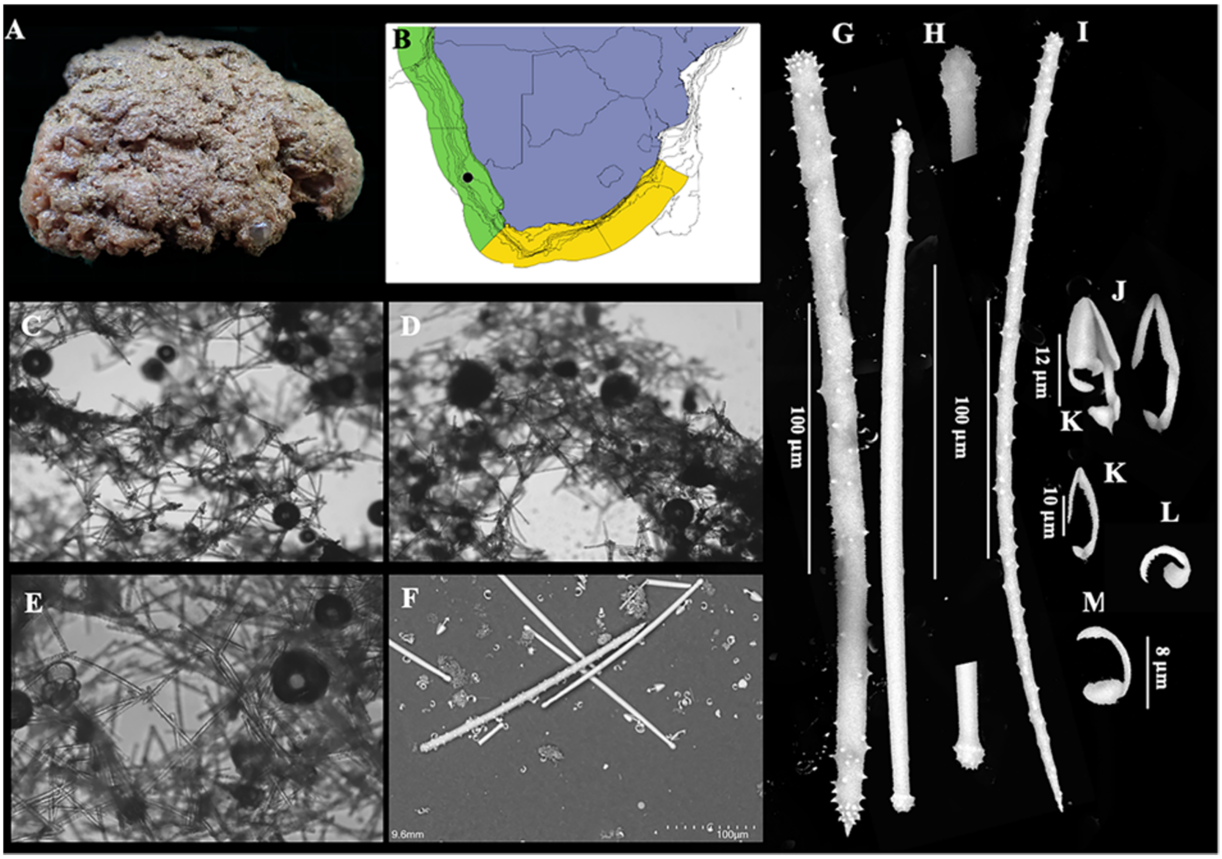

Figure 6. Iophon jansonae Samaai & Payne sp. nov., morphology and distribution: A. Holotype SAMC–A099316 (cross ref. TS 6560), preserved specimen; B. Distribution and type locality (black circle) of Iophon jansonae sp. nov.; C, D, E Cross-section of the choanosome of Holotype SAMC–A099316 (cross ref. TS 6560), 5 x, 10 x & 20 x) magnifications; F. Spicule compliment; G. Large acanthostyles from holotype SAMC–A099316; H. Terminally spined acanthotylostrongyles of holotype SAMC–A099316; I. long slender acanthostyles from holotype SAMC–A099316; J & K. Palmate anisochelae from holotype SAMC–A099316; L & M. Bipocilli from holotype SAMC–A099316.

Iophon bipocillum Aguilar-Camacho et al (2013) from the Mexican Tropical Pacific includes only bipocilli microscleres, and another three species bear exclusively palmate anisochelae as microscleres. These include *I. timidum* Desqueyroux-Faúndez and Van Soest, 1996 (South Pacific), *Iophon pictoni* Goodwin, Jones, Neely, and Brickle, 2011 (southwest Atlantic), and *Iophon abnormalis* Ridley and Dendy, 1886 (Prince Edward Islands, Southern Ocean) (Aguilar-Camacho et al 2013; de Voogd et al 2025).

The majority of the 46 species of *Iophon* described to date are recorded from the Southern Hemisphere (de Voogd et al 2025). Of these, only two species that have bipocilli and palmate anisochelae microscleres and acanthostyle megascleres are known from the Namaqua ecoregion. These comprise *Iophon proximum* Ridley, 1881 (type locality in Channels and Fjords of Southern Chile) and *Iophon cheliferum* Ridley and Dendy, 1886 (type locality in Namaqua, South Africa) (Lévi 1963; Samaai and Gibbons 2005; Uriz 1987, 1988).

Iophon proximum is an encrusting brown sponge, described from the Channels and Fjords of Southern Chile from a depth of 12–18 m. It comprises acanthostyles (158 × 9.5 µm), tylotes with microspined heads (158 × 8 µm), palmate anisochelae (25 µm), and bipocilli (10 µm) (Ridley 1881). However, after re-examining the holotype (BMNH 1879.12.27.5), Desqueyroux-Faúndez and Van Soest (1996) documented two categories of acanthostyles and anisochelae, with spicule measurements as follows: acanthostyles I: 138 (120–148) × 7 (6–8) µm, acanthostyles II: 101 (78–117) × 5–6 µm, tylotes: 147 (140–160) × 4 µm, anisochelae I: 24 (23–27) µm, anisochelae II: 18 (16–20) µm, and bipocilli: 6 µm.

Iophon cheliferum is a massive, honeycombed light brown to black (in alcohol) sponge that was described from southern Namaqua (off the Cape of Good Hope), South Africa at 274 m and from Prince Edward Islands (566 m) and Kerguelen (1005 m) in the Southern Ocean. This species has choanosomal acanthostyles: 400 (360–420) × 16–20 µm, tylotes with microspined heads: 300 (250–320) × 10 µm, palmate anisochelae: 19–30 µm, and bipocilli: 19 µm of a very peculiar form; shaft narrow and strongly bent, small end clawed, with two prongs (Ridley and Dendy 1886, 1887).

Iophon gibbonsi sp. nov. differs from these species with regard to its branching nature and large bipocilli of 'typical' form.

Key diagnostic characters

- branching form
- acanthostyles I approx. 200 µm long
- large bipocilli (16 µm) of typical form.

***Iophon jansonae* Samaai and Payne sp. nov.**

(Figure 6, Table 2)

urn:lsid:zoobank.org:act:686B5240-C862-4B4B-9232-12BE8041002A

Material examined. Holotype. SAMC–A099316 (cross ref. TS 6560): DFFE Demersal Research Trawl survey, South Africa west coast, Station A35083 (29.7562°S, 14.9412°E), 380 m depth, coll. FRS *Africana*, 6 March 2024.

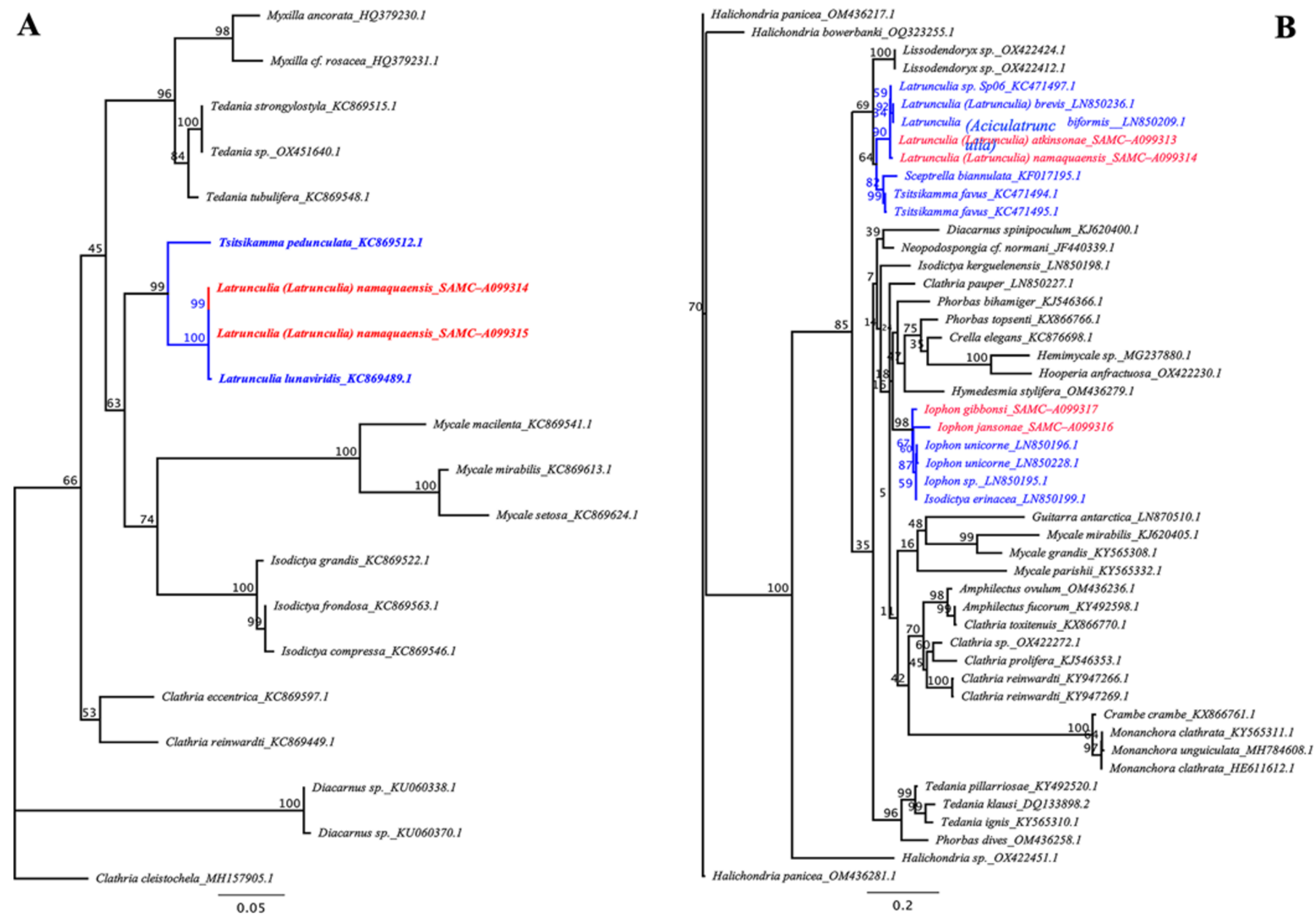

Figure 7. The phylogeny presented here shows the placement of the Latrunculia and Iophon species in relation to other species of Latrunculia, Iophon, and other Demospongiae species. This analysis was conducted using (a) the 28S rRNA (C2/D2 region) and (b) COI. The phylogeny was obtained using Maximum Likelihood, with bootstrap values indicated.

Etymology. Named in honour of Ms Liesl Janson, Marine Biodiversity Control Technician at DFFE-OCR, in recognition of her collaboration with the primary author on sponge research for over a decade.

Type locality (Figure 6b). West coast of South Africa, Namaqua ecoregion.

Distribution (Figure 6b). Currently only known from the west coast of South Africa, Namaqua ecoregion.

Description (Figure 6a). Thickly encrusting form. Length 70 mm, width 44 mm, and thickness 20 mm. Surface smooth and uneven, or markedly coarse with oscules visible and flush to surface, 1–4 mm in diameter. Texture fragile, spongy and soft. Colour in situ unknown, in preservative dark chocolate brown.

Skeleton (Figure 6c–e). Choanosomal skeleton comprises an isodictyal, uni-reticulation of thick acanthostyles, with little spongin. Ectosomal skeleton comprises stout brushes of acanthotylotes which ascend to surface and support dermal membrane. Microscleres scattered throughout choanosome.

Spiculation (Figure 6g–m). Megascleres. Acanthostyles, spination on shaft variable, full spines concentrated on top and fusiform region: 368 (364–386) × 17 (17) µm, $n = 25$ (Figure 6g). Acanthostyles, thin, fully spined: 333 (286–364) × 8 (8) µm, $n = 25$ (Figure 6i). Tylotes with rounded ends, terminally spined: 275 (263–286) × 6 (6) µm, $n = 25$ (Figure 6h). **Microscleres.** Bipocilli in two size categories: (I) 28 (28) µm, $n = 25$ (Figure 6m); (II) 17 (17) µm, $n = 25$ (Figure 6l). Palmate anisochelae with medial spur in two size categories: (I) 58 (50–67) µm, $n = 25$ (Figure 6j); (II) 30 (28–34) µm, $n = 25$ (Figure 6k).

GenBank accession numbers. COI PX526485.

Molecular data. A COI sequence data was produced from holotype SAMC–A099316. Pair-wise sequence divergence (uncorrected p-distance) for the COI fragment revealed a notable separation from other *Iophon* species, forming a strongly supported clade (see Supplementary Table S1 and Figure 7b). The COI genetic distances found between *Iophon* species are in accordance with values previously found for other sponge species (see Supplementary Table S2).

Substratum, depth range, and ecology.

This species was found at a depth of 380 meters in rariphotic, unconsolidated soft-sediment habitat.

Remarks. Three species of *Iophon* have been recorded from the Namaqua ecoregion, including *I. proximum, I. cheliferum*, and *I. gibbonsi* sp. nov. Although having an overlapping geographic distribution, *I. jansonae* sp. nov. differs in that it has a second category of thin and long acanthostyles that form the primary isodictyal reticulation of the choanosome. In addition, this species also has two categories of bipocilli and palmate anisochelae microscleres,

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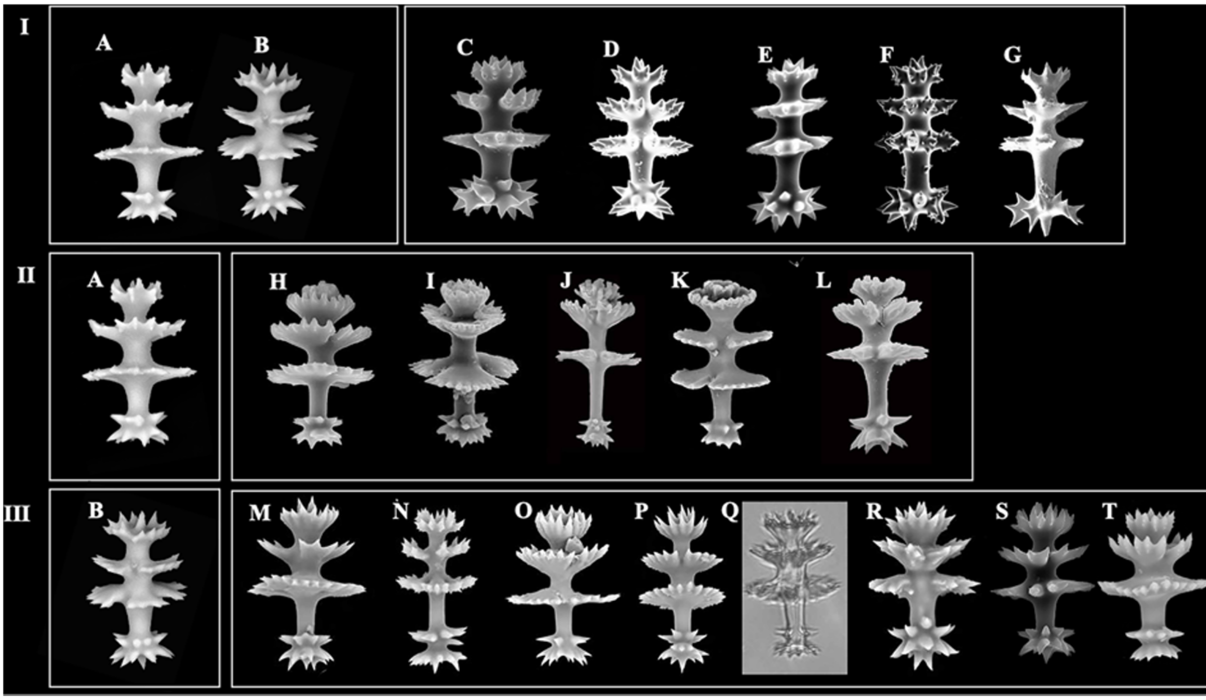

Figure 8. Comparison of the diagnostic anisodiscorhabds in Latrunculia (not to scale): A. Latrunculia (Latrunculia) namaquaensis Samaai & Payne sp. nov.; B. Latrunculia (Latrunculia) atkinsonae Samaai & Payne sp. nov.; C-G. Latrunculia (Biannulata) species from South Africa. C. Latrunculia (Biannulata) lunaviridis Samaai & Kelly, 2003; D. Latrunculia (Biannulata) kerwathi Samaai, Janson & Kelly, 2012; E. Latrunculia (Biannulata) gotzi Samaai, Janson & Kelly, 2012; F. Latrunculia (Biannulata) microacanthoxea Samaai & Kelly, 2003; G. Latrunculia (Biannulata) algoaensis Samaai, Janson & Kelly, 2012. H-T. Latrunculia (Latrunculia) species. H. Latrunculia (Latrunculia) bocagei Ridley & Dendy, 1886; I. Latrunculia (Latrunculia) basalis Kirkpatrick, 1908; J. Latrunculia (Latrunculia) lendenfeldi Hentschel, 1914; K. Latrunculia (Latrunculia) toufieki Kelly & Sim-Smith, 2022; L. Latrunculia (Latrunculia) bransfieldi Kelly & Sim-Smith, 2022; M. Latrunculia (Latrunculia) brevis Ridley & Dendy, 1886; N. Latrunculia (Latrunculia) fiordensis Alvarez, Bergquist & Battershill, 2002; O. Latrunculia (Latrunculia) nelumbo Kelly & Sim-Smith 2022; P. Latrunculia (Latrunculia) kiwi Kelly & Sim-Smith, 2022; Q. Latrunculia (Latrunculia) magistra Kelly & Sim-Smith, 2022; R. Latrunculia (Latrunculia) variornata Kelly & Sim-Smith, 2022. S. Latrunculia (Latrunculia) ciruela Hajdu, Desqueyroux-Faúndez, Carvalho, Lôbo-Hajdu & Willenz, 2013; T. Latrunculia (Latrunculia) morrisoni Kelly & Sim-Smith, 2022.

as well as tylotes that have prominent round (golf ball-like) ends that are terminally spined.

Key diagnostic characters

- thickly encrusting
- acanthostyles > 200 µm long
- bipocilli in two size categories of typical form.

Discussion

Although 9,736 valid recent sponge species are recognized worldwide (de Voogd et al 2025), Porifera remain historically understudied, with high potential for new species discoveries. There are 436 sponge species known in temperate southern Africa, including 169 from the Benguela province and 76 from the Namaqua ecoregion (de Voogd et al 2025). This study describes four new sponge species, improving our understanding of Namaqua sponge biodiversity, and documents a range extension for *L.* (*A.*) *biformis*, thereby increasing the number of recorded sponge species in the Benguela province to 173 and the Namaqua ecoregion to 80.

The discovery of these new species in mesophotic and rariphotic sediment habitats on the shelf; areas which have been subjected to commercial demersal trawling since the 1890s (Payne and Punt, 1995) and annual DFFE research trawl surveys, indicates the persistence of cryptic biodiversity within well-sampled yet ecologically complex environments. Despite over a century of intensive trawling activity, numerous sponge species from shelf sediment along the west coast remain undocumented and undescribed (Samaai, unpublished data), highlighting significant knowledge gaps in our understanding of the benthic biodiversity of South Africa and Namibia. These findings highlight the fundamental importance of conserving mesophotic and rariphotic soft sediment habitats and their associated fauna, as these ecosystems maintain distinct sponge assemblages that play key roles in benthic ecosystem functioning and resilience.

The Namaqua ecoregion has been extensively studied in shallow waters (Lévi 1963, 1967; Samaai and Gibbons 2005; Stephens 1915; Uriz 1987), but only modestly characterized in terms of deeper shelf sponge diversity between 50 and 500 m depth (Samaai et al 2018; Uriz 1988), with even less exploration beyond 500 m and on the continental slope (Griffiths et al., 2010). This study highlights the urgent need for extensive, continuous surveys throughout the South African EEZ, particularly in the deeper and less-studied zones. Conservation of mesophotic soft sediment habitats is critical for protecting these vulnerable, varied communities, especially in places extensively damaged by fishing and other anthropogenic pressures. The observed range extension of *L.* (*A.*) *biformis* implies that some sponge species may have larger environmental tolerances than previously thought, aided by variables such as hydrodynamic connection and habitat availability. This finding calls for comprehensive biogeographic studies that combine morphological and genetic data to better define species distributions and boundaries in the Namaqua ecoregion.

In conclusion, the discovery of new sponge species and range expansions in anthropogenically damaged locations (e.g., highly trawled) highlights the underappreciated richness of these

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mesophotic soft substrate systems. It highlights the crucial need of integrating sponge diversity research into marine spatial planning and conservation efforts in order to protect benthic habitats and the ecosystem services they provide within the Benguela Current ecosystem. Future research should focus on systematic sampling of shelf sediments and molecular phylogenetics to increase taxonomy and knowledge of sponge ecological roles, ultimately resulting in better conservation and management of these vulnerable marine ecosystems.

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Data availability. The authors confirm that the data supporting the findings of this study are available within the article (and/or its supplementary materials).

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