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# Corals of the South-west Indian Ocean III. Alcyonacea (Octocorallia) of Bazaruto Island, Mozambique, with a redescription of *Cladiella australis* (Macfadyen, 1936) and a description of *Cladiella kashmani* spec. nov.

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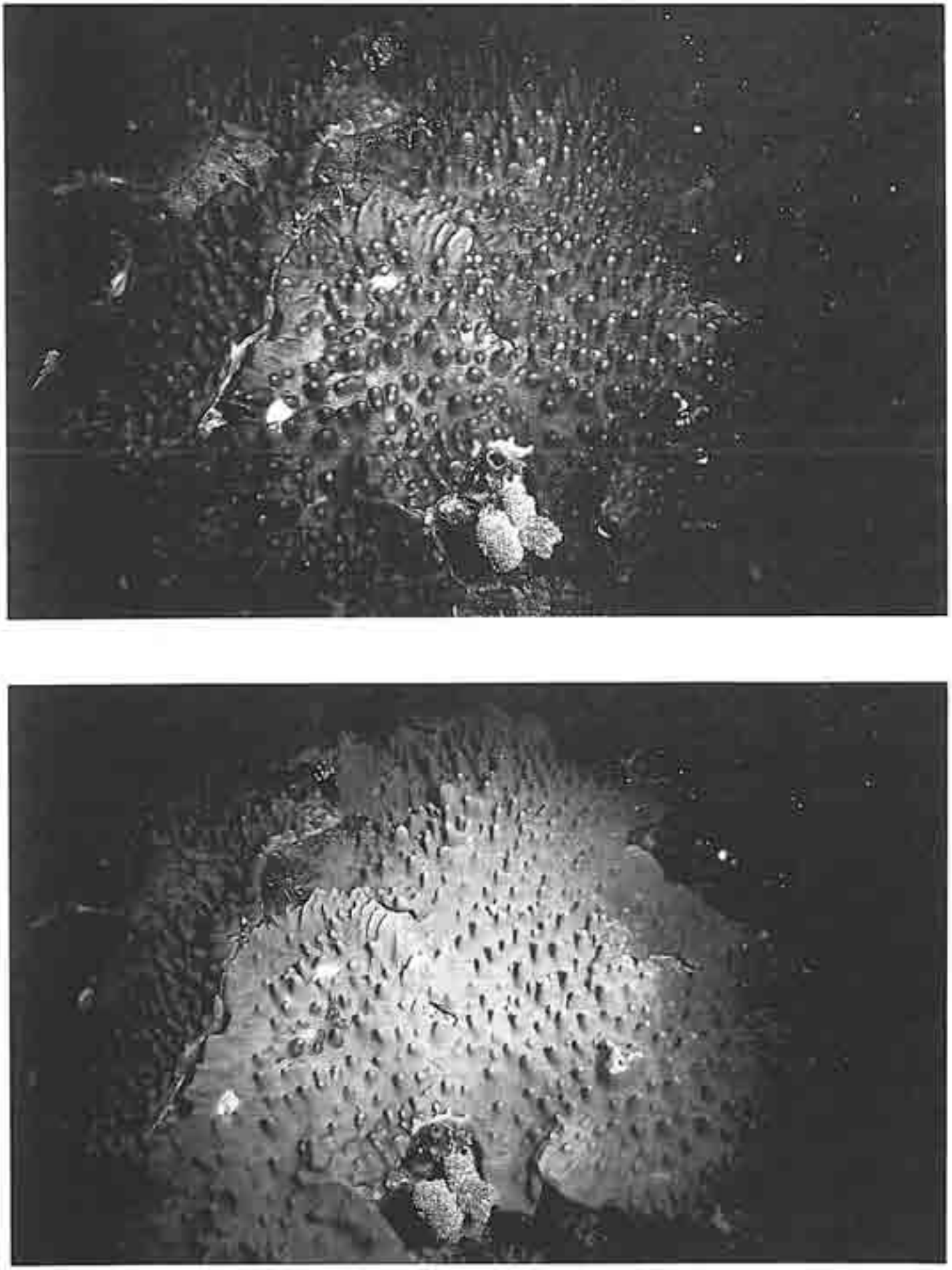

Frontispiece. A large colony of *Cladiella kashmani* spec. nov. in its natural habitat with polyps expanded (top) and retracted (bottom).

# Corals of the South-west Indian Ocean III. Alcyonacea (Octocorallia) of Bazaruto Island, Mozambique, with a redescription of *Cladiella australis* (Macfadyen, 1936) and a description of *Cladiella kashmani* spec. nov.

by

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## ABSTRACT

A list of 27 species of Alcyonacea is presented for the coral reefs of Bazaruto Island, Mozambique. The holotype of *Cladiella australis* (Macfadyen, 1936), a species of the genus with large sclerites found in the study area, is redescribed. A new species, *Cladiella kashmani*, is described from the reefs of Bazaruto Island and Sodwana Bay on the KwaZulu-Natal coast, South Africa. It is characterized by numerous long and tuberculate spindles in its lobes and has the largest sclerites ever described for any *Cladiella* species. The two species that occur on the southern African reefs are compared but appear distinctive. The abundance, diversity and distribution of the soft corals on Bazaruto reefs are discussed in relation to the environment and compared with findings elsewhere on the east African coast.

Keywords: Cnidaria, Octocorallia, Alcyonacea, *Cladiella*, reefs, Bazaruto Archipelago, Mozambique, Sodwana Bay, South Africa.

## INTRODUCTION

Soft coral surveys in the tropical western Indian Ocean have, to date, been focused primarily on reefs in the Red Sea (e.g. Benayahu, 1985, 1990), Madagascar (e.g. Verseveldt, 1973) and the Seychelles (Verseveldt, 1976). Studies on the soft coral fauna of reef complexes along the east African mainland have been limited to a few sites such as Inhaca Island, Mozambique (Tixier-Durivault, 1960), Tanzania (Ofwegen & Benayahu, 1992) and Sodwana Bay, South Africa (Williams, 1992; Benayahu, 1993; Benayahu & Schleyer, 1995).

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This publication deals, for the first time, with Alcyonacea (Cnidaria: Octocorallia) from the reefs of Bazaruto Island, Mozambique, extending the information on soft corals on the southern African coast. Soft corals were collected on nine reefs off Bazaruto Island (Fig. 1) in January 1992, July 1993 and October 1994. These constitute the major coral inhabited reefs in the Bazaruto Archipelago. Air transport limited the size of the collection and Alcyonacea were only removed from the following sites: Twelve-mile Reef (21° 21'18" S; 35° 30'12" E), Outer Lighthouse Reef (21° 31'15" S; 35° 29'50" E), Inner Lighthouse Reef (21° 31'30" S; 35° 29'35" E), Ponta Goane (or Venges Reef; 21° 38'10" S; 35° 29'45" E), Ponta Chilola (or Xilola; 21° 42'13" S; 35° 29'54" E), and Guinice (21° 36'05" S; 35° 29'31" E). The collection was thus representative rather than comprehensive, but notes within the text indicate the distribution of the organisms as far as possible.

The collections were carried out by M. H. Schleyer using snorkel and SCUBA equipment, and comprised 70 specimens. The material is kept in the Zoological Museum, Department of Zoology, Tel Aviv University, Israel, abbreviated in the paper as ZMTAU. The survey yielded 27 species, one of which is new. In the course of identifying the *Cladiella* specimens, some were found to contain large sclerites. This led us to examine the holotype of *Cladiella australis*, which had been designated by Macfadyen (1936). The holotype was, regrettably, examined and redescribed too late to prevent a mistake in the identification of some *Cladiella* colonies collected from Sodwana Bay, South Africa, as *C. australis* (see Benayahu, 1993). Although *C. australis* (Macfadyen, 1936) was present in the Bazaruto collection, a new species, *Cladiella kashmani*, with the largest sclerites found so far within the genus, was discovered amongst both the Sodwana Bay and Bazaruto samples. The faunistic features and distributional patterns of the alcyonaceans on the study reefs are presented and compared with those of other southern African reefs.

## MATERIAL AND METHODS

The specimens were fixed in 4% formalin in seawater, rinsed in freshwater after 24 hours, and then transferred to 70% ethyl alcohol. Sclerites for identification were obtained by dissolving the organic tissues with 10% sodium hypochlorite. Sclerites for scanning electron microscopy were carefully rinsed with double distilled water, dried at room temperature, coated with gold, and then examined with an Amray scanning electron microscope at 25 kV.

## RESULTS

### List of species

The following is a list of species of the families Tubiporidae, Alcyoniidae and Xeniidae collected at Bazaruto Island:

Order Alcyonacea Lamouroux, 1816; amended by Bayer (1981)
Family Tubiporidae Ehrenberg, 1828
Genus *Tubipora* Linnaeus, 1758
*T. musica* Linnaeus, 1758:
ZMTAU Co 28790

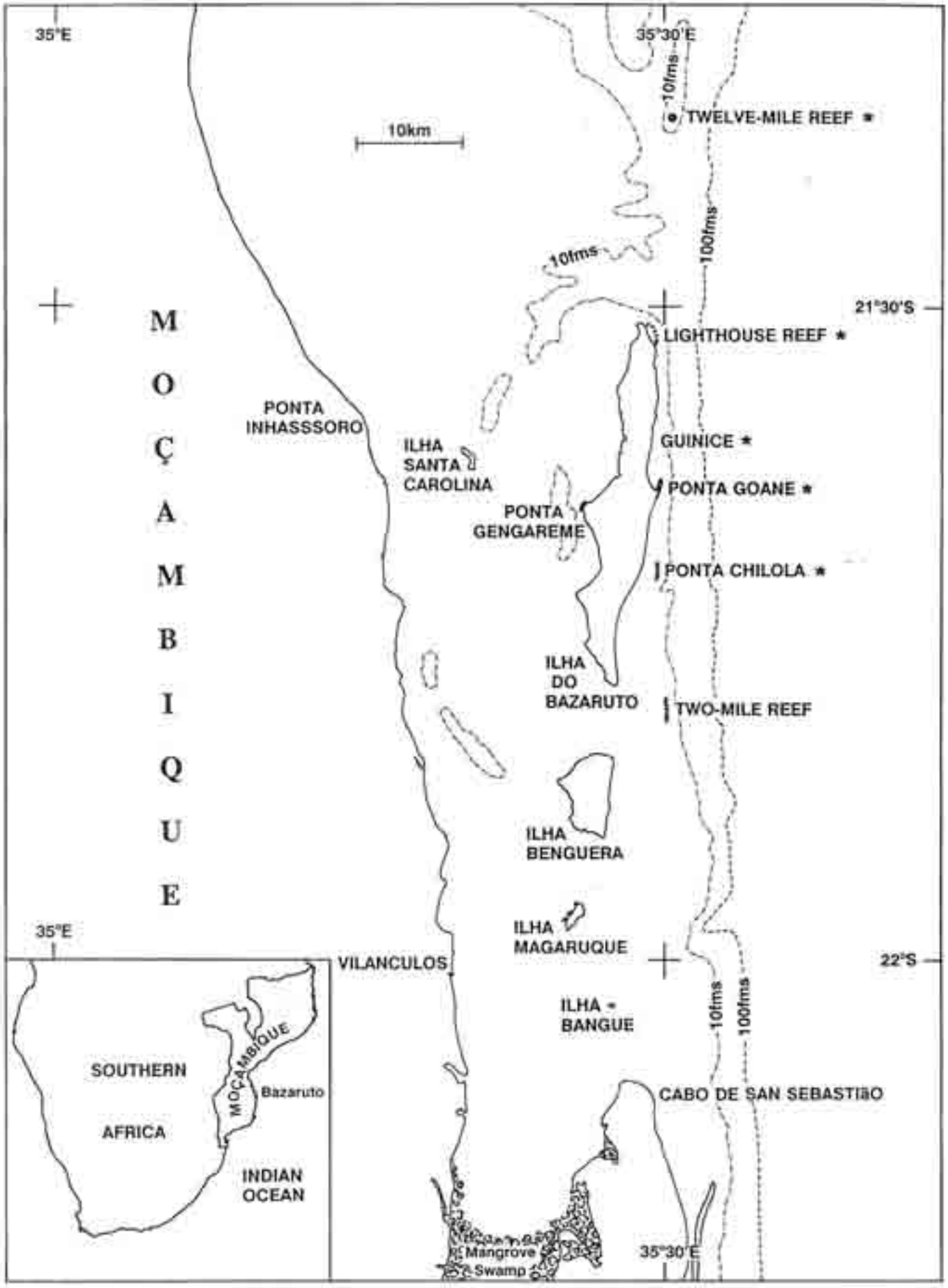


Figure 1. Map of the Bazaruto Archipelago showing the major reefs. Alcyonacean soft corals were collected at the sites marked with an asterisk.

Family Alcyoniidae Lamouroux, 1812

Genus *Cladiella* Gray, 1869

*C. australis* (Macfadyen, 1936):
ZMTAU Co 28751, 28764, 28780, 28798, 28799

*C. kashmani* spec. nov.:
ZMTAU Co 28755

*C. krempfi* Hickson, 1919:
ZMTAU Co 28756, 28757

Genus *Lobophytum* von Marenzeller, 1886

*L. crassum* von Marenzeller, 1886:
ZMTAU Co 28728, 28742, 28777, 28782

*L. venustum* Tixier-Durivault, 1957:
ZMTAU Co 28740, 28743, 28749, 28758, 28767

*L. patulum* Tixier-Durivault, 1956:
ZMTAU Co 28750

Genus *Sarcophyton* Lesson, 1834

*S. flexuosum* Tixier-Durivault, 1966:
ZMTAU Co 28741, 28748, 28752

*S. gemmatum* Verseveldt & Benayahu, 1978:
ZMTAU Co 2879

*S. glaucum* (Quoy & Gaimard, 1833):
ZMTAU Co 28747, 28766

*S. subviride* Tixier-Durivault, 1958:
ZMTAU Co 28768, 28771

*S. trochellophorum* von Marenzeller, 1886:
ZMTAU Co 28739, 28744, 28746, 28770

Genus *Sinularia* May, 1898

*S. abrupta* Tixier Durivault, 1970:
ZMTAU Co 28731, 28732, 28736, 28738, 28762, 28763, 28772

*S. brassica* May, 1898:
ZMTAU Co 28727, 28729, 28737, 28753, 28776, 28778, 28783

*S. dura* (Pratt, 1903):
ZMTAU Co 28734

*S. erecta* Tixier-Durivault, 1945:
ZMTAU Co 28761

*S. flexuosa* Tixier-Durivault, 1945:
ZMTAU Co 28795

*S. grandilobata* Verseveldt, 1980:
ZMTAU Co 28791

*S. gyrosa* (Klunzinger, 1877):
ZMTAU Co 28745, 28759, 28765, 28769, 28775

*S. heterospiculata* Verseveldt, 1970:
ZMTAU Co 28733, 28779

*S. leptoclados* (Ehrenberg, 1834):
ZMTAU Co 28789, 28796

*S. macrodactyla* Kolonko, 1926:
ZMTAU Co 28726, 28730, 28760, 28781

*S. notanda* Tixier-Durivault, 1966:

ZMTAU Co 28792, 28793
*S. polydactyla* (Ehrenberg, 1834):
ZMTAU Co 28735
*S. triangula* Tixier-Durivault, 1970:
ZMTAU Co 28794
Family Xeniidae Ehrenberg, 1828
Genus *Anthelia* Lamarck, 1816
*A. flava* (May, 1899)
ZMTAU Co 28802, 28803, 28804
Genus *Xenia* Lamarck, 1816
*X. impulsatilla* Verseveldt & Cohen, 1971
ZMTAU Co 28801

Members of the Nephtheidae were also collected and are still being examined.

**Systematics**

The examination of the present collection yielded several *Cladiella* specimens with large sclerites (>0.15 mm). Results of examination of the holotype of *C. australis* (Macfadyen, 1936) yielded the redescription presented below. This species was notable for the largest sclerites described to date within the genus (Tixier-Durivault, 1948). Our findings led to a re-examination of specimens previously identified as *C. australis* (Macfadyen, 1936) from Sodwana Bay, KwaZulu-Natal coast, South Africa (Benayahu, 1993). We concluded that they were incorrectly identified and were identical to a specimen from the current Bazaruto collection. We assigned these colonies to *C. kashmani* spec. nov., which therefore occurs both on Bazaruto and Sodwana Bay reefs.

*Cladiella australis* **(Macfadyen, 1936)**
(Figs 2-6)

*Alcyonium australe* Macfadyen, 1936 : 31-32, fig. 1, pl. IV, fig. 4.
*Lobularia australis* (Macfadyen, 1936): Tixier-Durivault, 1948: 249-252, figs 246-248.
*Lobularia australis* (Macfadyen, 1936): Tixier Durivault, 1953: 313-314.
*?Cladiella australis* (Macfadyen, 1936): Tixier-Durivault, 1970: 120-121.
*?Cladiella australis* (Macfadyen, 1936): Verseveldt, 1976: 499-501, fig. 1, Pl. fig. 5.
*Cladiella australis* (Macfadyen, 1936): Ofwegen & Benayahu, 1992: 139 (listed only).
*Cladiella australis* (Macfadyen, 1936): Benayahu, 1995: 106 (listed only).
Not *Cladiella australis* (Macfadyen, 1936): Benayahu, 1993: 5 (listed only).

Type Material.- Holotype - *Alcyonium australis* BMNH no. 1934.3.28.1, Maer Island, N.W. Reef Flat, Great Barrier Reef Expedition. 11.5.1929.

**Description**

The holotype (Fig. 2a, b) has a maximum cross-section of 8.5 x 7.0 cm. The base is 2.5-5.0 cm high and it grows over a calcareous fragment (Fig. 2b). Most of the lobes are flattened laterally and divided into short secondary lobules; some of the lobes are short and digitiform. The lobes are densely packed and slope markedly to

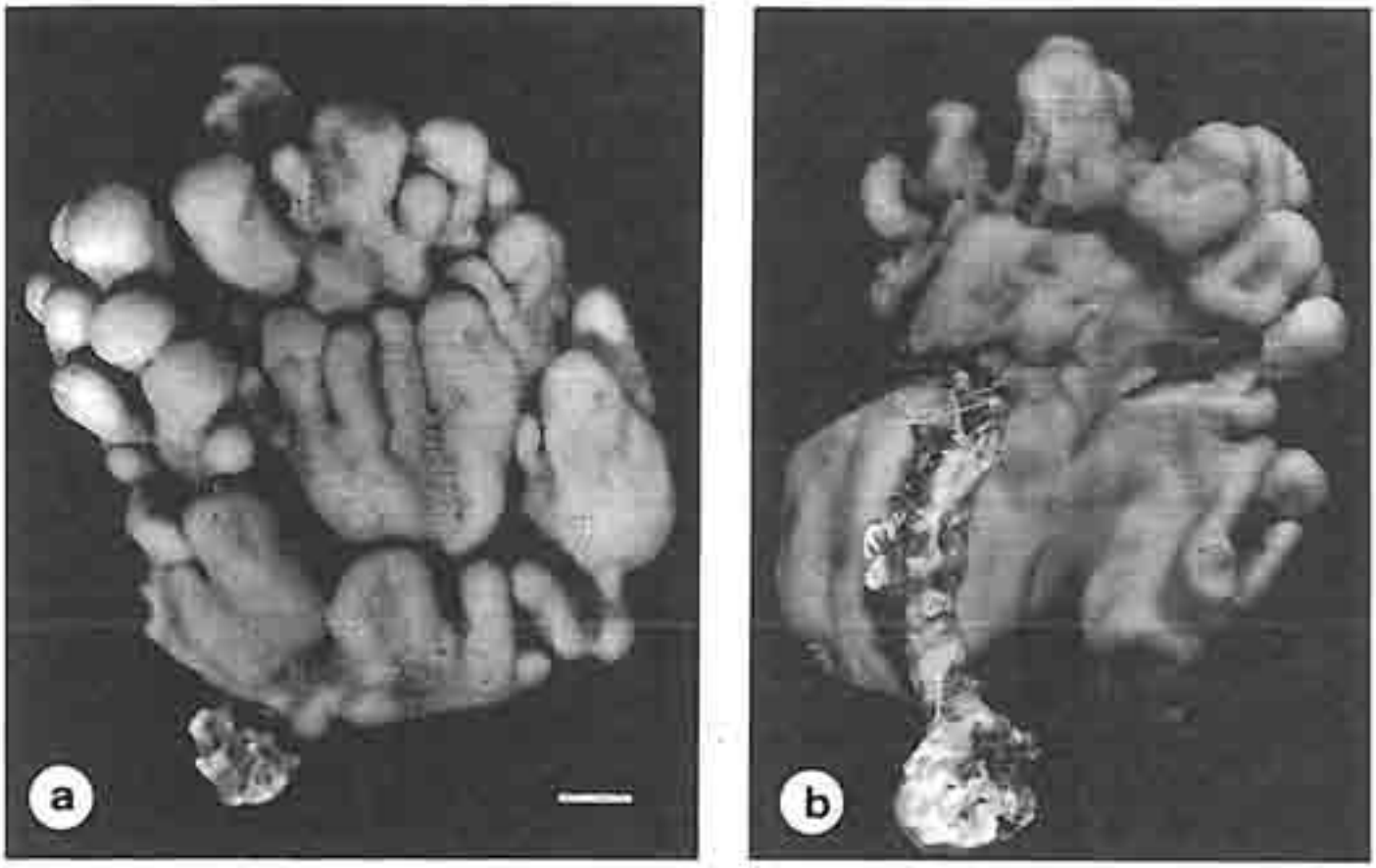


Figure 2. Upper surface (2a) and basal-lower side (2b) of the *Cladiella australis* (Macfadyen, 1936) holotype (BMNH no. 1934.3.28.1). Scale at 2a, 10 mm, applies to 2a, b.

one side of the colony. They are firm and rounded at their tips. The polyps are completely retracted on the upper parts of the lobes and, on their lower parts, anthocodiae can be seen in various degrees of contraction. The centres of most polyps are 0.7-1.0 mm apart. The surface layer of the lobes contains mainly dumb-bells with some elongate sclerites (Figs 3, 4). The dumb-bells are 0.13-0.21 mm long (Fig. 3a-l, Fig. 4a-c); occasionally their waist is reduced to a mere line (Fig. 3c, f). A few other sclerites are warty derivatives of the dumb-bells with no waist, but with radiate processes (Fig. 4d). The elongate sclerites have two zones of warts, sharpened ends, and are 0.18-0.23 mm long (Fig. 4e-l). The lobes contain dumb-bells in their interior similar to those found on their surface.

The surface layer and the interior of the base both have similar dumb-bells (Figs. 5, 6) of a wide size range. Some are small, 0.09-0.13 mm long (Fig. 5a-f), and are tiny forms of the larger, common dumb-bells which are up to 0.18 mm long (Figs. 5g-m, 6a-h). There are no sclerites in the polyps of the colony.

## Colour

In alcohol, the holotype is light greenish-gray in colour.

## Remarks

Macfadyen (1936) originally described this species as *Alcyonium australe*. Later, Tixier-Durivault (1948) referred it to *Lobularia australis* (Macfadyen, 1936) in her re-

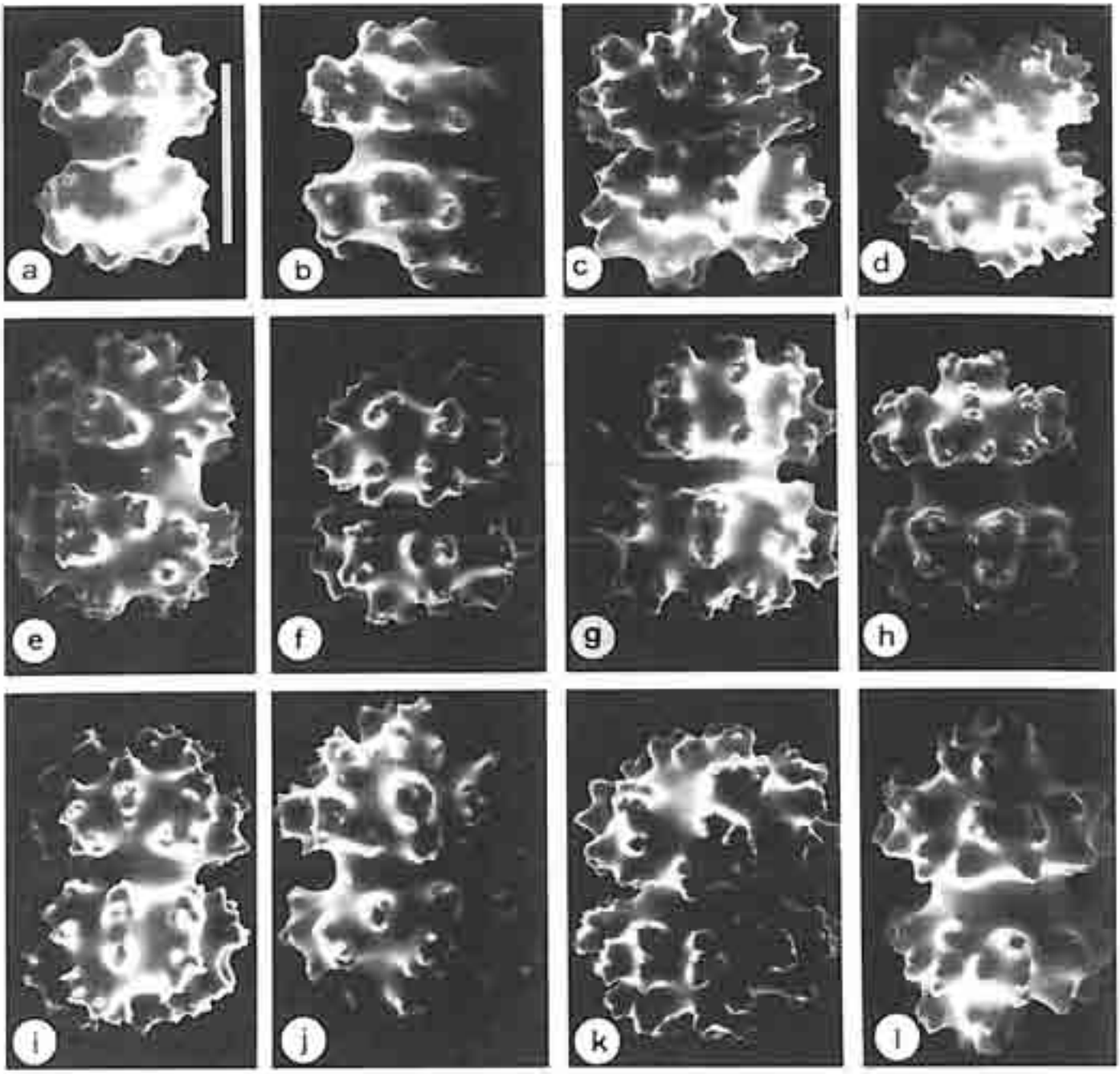


Figure 3. *Cladiella australis* (Macfadyen, 1936), holotype (BMNH no. 1934.3.28.1), sclerites of the surface layer of the lobe. Scale at 3a, 0.1 mm, applies to 3a-l.

vision of the genus. She did not examine the holotype, but presented enlargements (Tixier-Durivault, 1948: 250-251) of the original drawings of Macfadyen (1936: 31). Tixier-Durivault (1970) later assigned this species to the genus *Cladiella*. The present findings generally agree with the original description of *Alcyonium australe*, as made by Macfadyen (1936). Nonetheless, this description did not refer to the elongated sclerites found only in the surface layer of the lobes. Similarly, it did not adequately describe the minute dumb-bells in the base. The absence of sclerites in the polyps of the holotype contradicts Verseveldt's findings in a specimen from the Seychelles (Verseveldt, 1976: Fig. 1). The size of the sclerites in *C. australis* mentioned by Verseveldt (1976) agrees with the diagnosis of Macfadyen (1936). However, the range of 0.14-0.30 mm given by Tixier-Durivault (1970), is greater than that found in the holotype. The current re-examination of the holotype confirms that, within its genus,

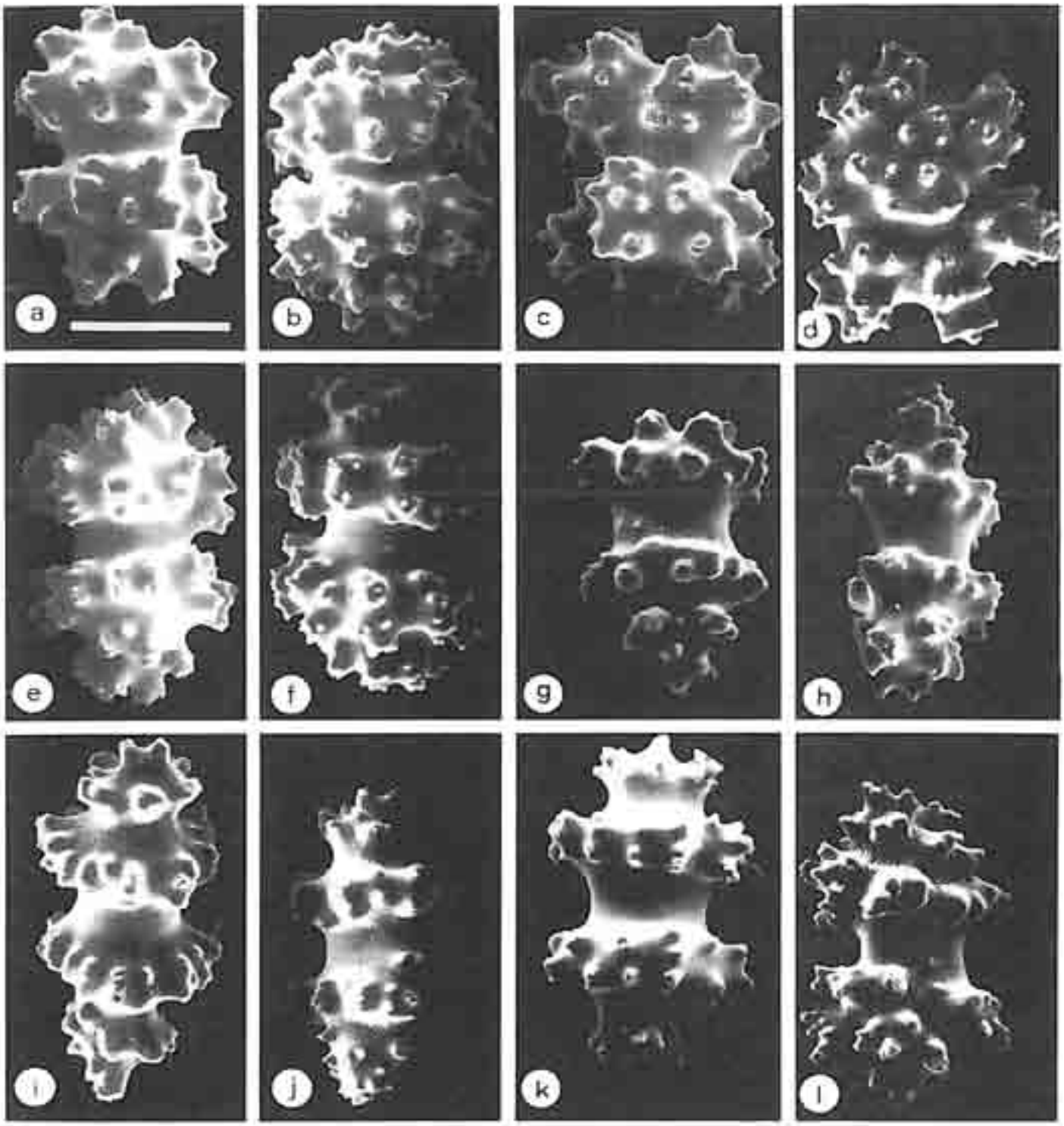


Figure 4. *Cladiella australis* (Macfadyen, 1936), holotype (BMNH no. 1934.3.28.1), sclerites of the surface layer of the lobe. Scale at 4a, 0.1 mm, applies to 4a-l.

*C. australis* indeed has remarkably large sclerites as noted by Tixier-Durivault (1948). *C. ceylonica* (Pratt, 1905) also has relatively large sclerites (0.12-0.15 mm), yet they are smaller than those found in *C. australis*. In addition, *C. ceylonica* has conspicuous polyp sclerites which are absent in the holotype of *C. australis*. Therefore, until the genus is revised, it seems that these differences justify keeping the two species separate.

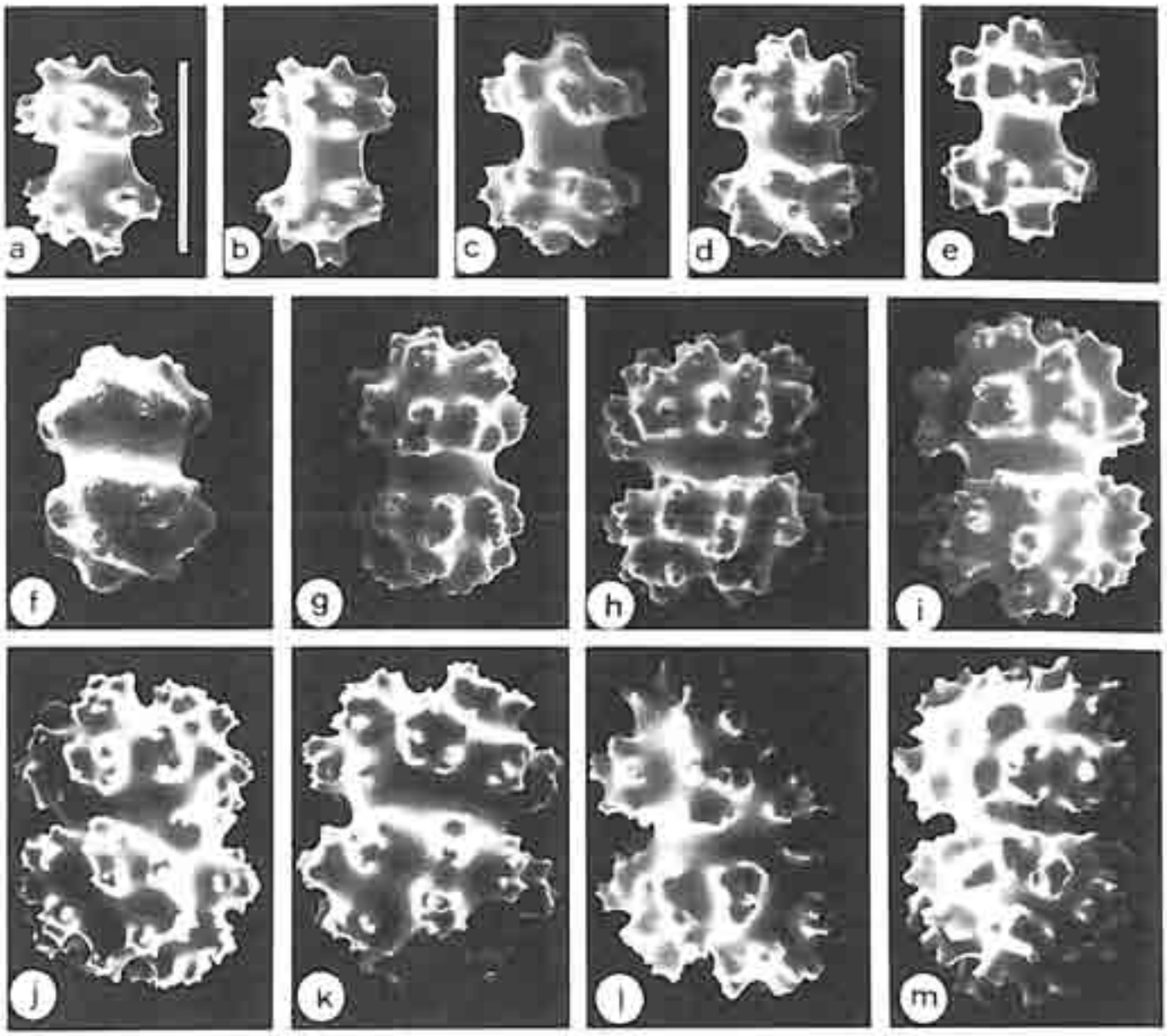


Figure 5. *Cladiella australis* (Macfadyen, 1936), holotype (BMNH no. 1934.3.28.1), sclerites from the surface of the base and its interior. Scale at 5a, 0.1 mm, applies to 5a-m.

**Other Material**

Bazaruto Island, Inner Lighthouse Reef, 4 July 1993 (ZMTAU Co 28751, 28764); Ponta Chilola (Xilola) Reef (ZMTAU Co 28780); Twelve-mile Reef, 19 October 1994 (ZMTAU Co 28798) and Ponta Chilola, 20 October 1994 (ZMTAU Co 28799).

The morphology of these colonies and their sclerite shape and size were the same as those of the holotype of *C. australis*. Their colour in alcohol is light cream. None of these specimens have polyp sclerites.

A similar examination of material collected at Sodwana Bay on the KwaZulu-Natal coast, South Africa, and listed as *C. australis* (Benayahu, 1993), led to the conclusion that the South African specimens were incorrectly identified and should be assigned to a new *Cladiella* species (see overleaf).

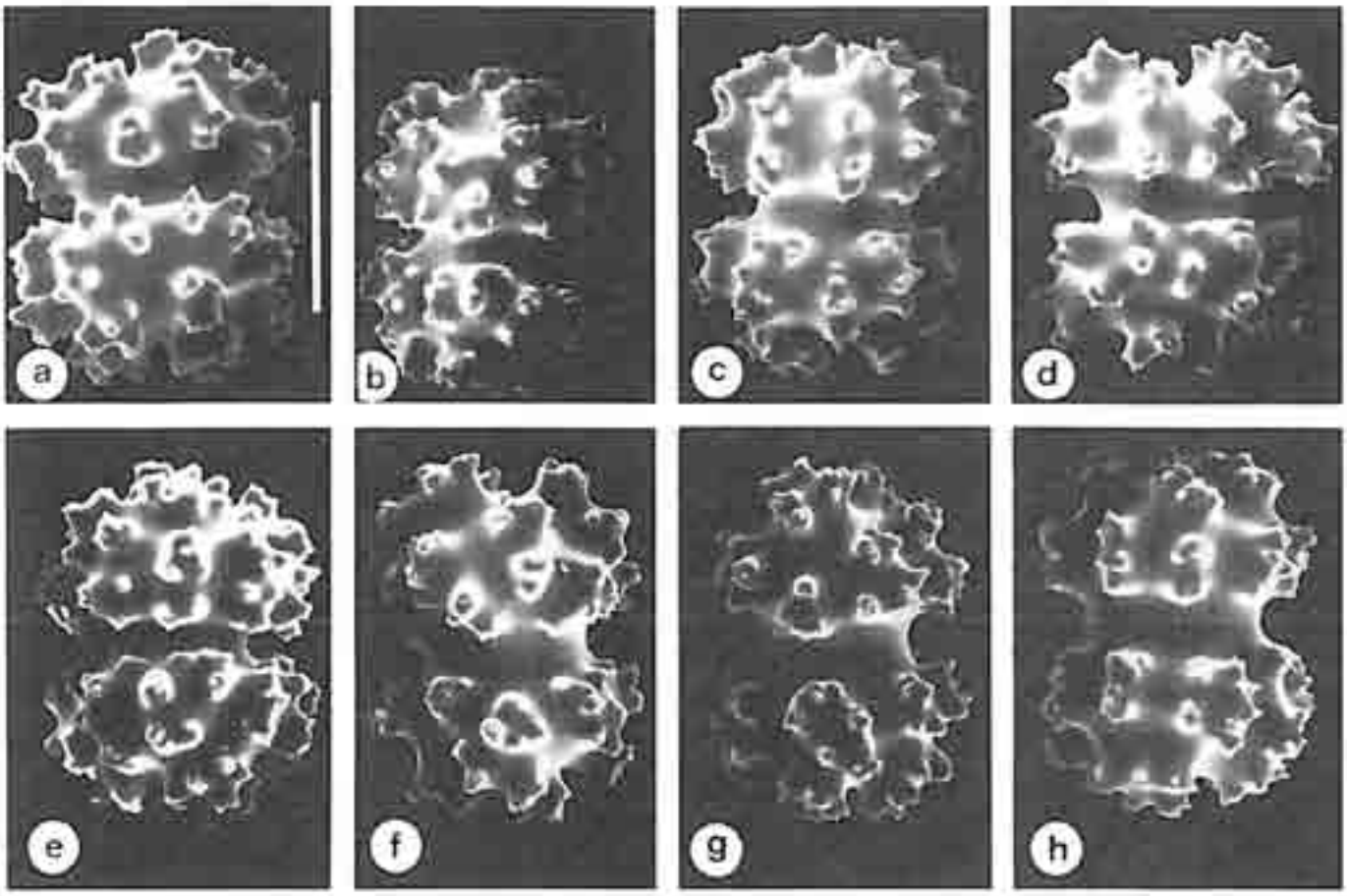


Figure 6. *Cladiella australis* (Macfadyen, 1936), holotype (BMNH no. 1934.3.28.1), sclerites from the surface of the base and its interior. Scale at 6a, 0.1 mm, applies to 6a-h.

**Distribution**

Australia, Fiji Islands, Vietnam, Tanzania, Okinawa and Mozambique.

## *Cladiella kashmani* spec. nov.

(Frontispiece, Figs 7-12)

**Material**

Holotype (ZMTAU Co 27792) Sodwana Bay, KwaZulu-Natal, South Africa, Two-Mile Reef, depth 12-14 m, 19 July 1991, *leg.* Y. Benayahu; two paratypes (ZMTAU Co 27850) Sodwana Bay, KwaZulu-Natal, South Africa, Nine-Mile Reef, depth 8-10 m, 22 July 1991, *leg.* Y. Benayahu; and (ZMTAU Co 28755) Bazaruto Island, Mozambique, Inner Lighthouse Reef, depth 4 m, 4 July 1993, *leg.* M. H. Schleyer.

**Description**

The holotype and the two paratypes are illustrated in Fig. 7a-c. The holotype (ZMTAU Co 27792) has a maximum cross section of 10 x 11 cm and a stalk of 1.5-2.3 cm, covered in part by the margins of the capitulum (Fig. 7a). The holotype is stiff and has compound lobes which are rather closely set, sometimes laterally flattened, or divided into rounded or irregular lobules. Almost all the polyps are fully retracted and

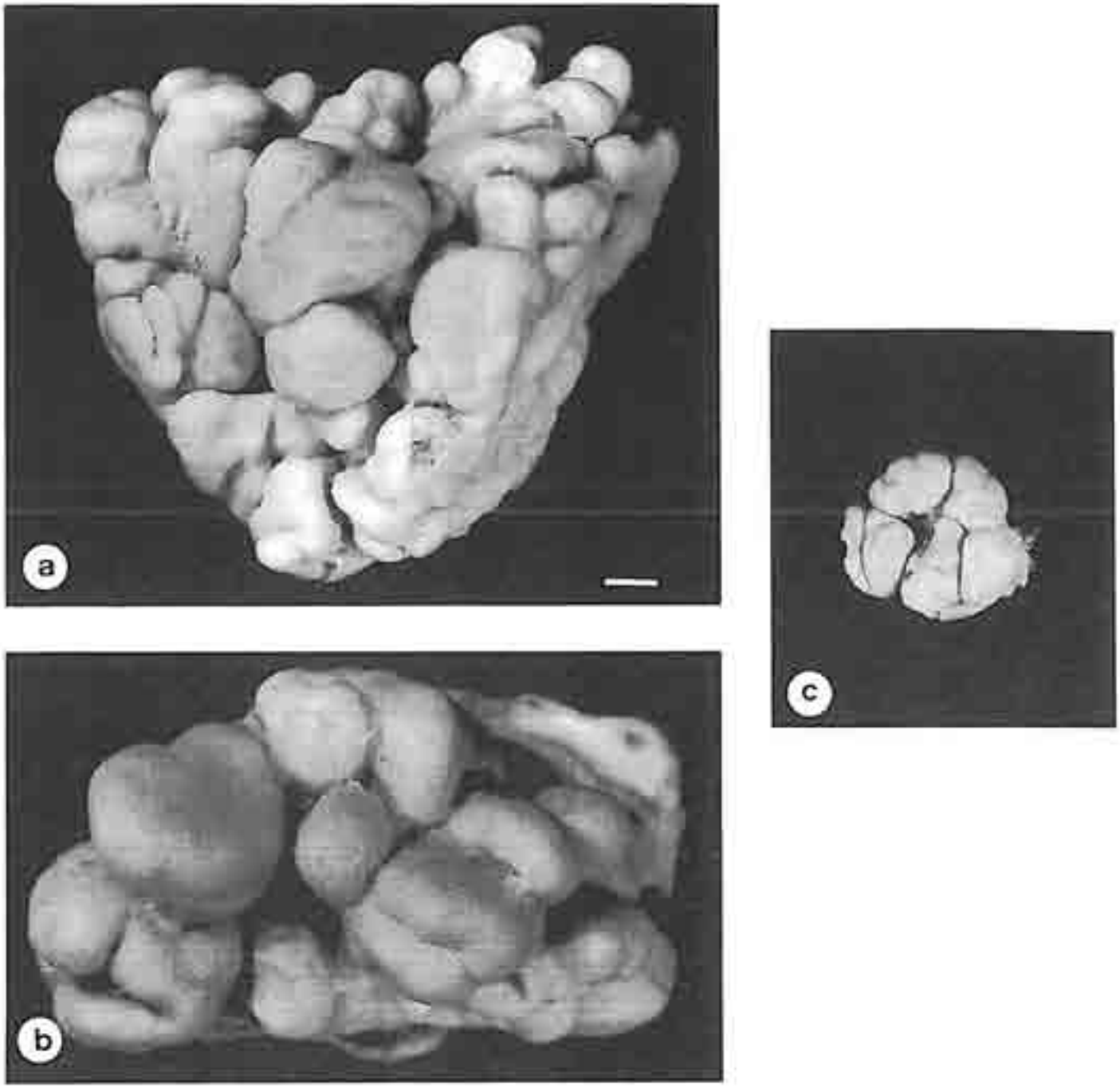


Figure 7. *Cladiella kashmani* spec. nov., a, holotype (ZMTAU Co 27792); b, c, paratypes (ZMTAU Co 27850, 28755). Scale at 7a, 10 mm, applies to 7a-c.

only tiny openings are seen on the surface of the lobes, their centres being 0.7-1.2 mm apart.

The surface of the lobes has a variety of sclerites (Figs 8, 9). Some are shuttles which are either nearly smooth or have cone-shaped prominences and are 0.13-0.19 mm in length (Fig. 8a-d). In addition, there are numerous sclerites which are 0.17-0.29 mm long, with coarse tubercular processes, mostly with a distinct median waist, thereby resembling capstans and double cones (Fig. 8e-q). Only a minority resemble dumb-bells and are up to 0.28 mm long (Fig. 9a, b). Others are tuberculate spindles with volcano-shaped or pointed processes, and are 0.26-0.37 mm long (Fig. 9c-n). Few of them possess prominent or irregular processes (Fig. 9b, d). The interior of the lobes has sclerites similar to those found on their surface.

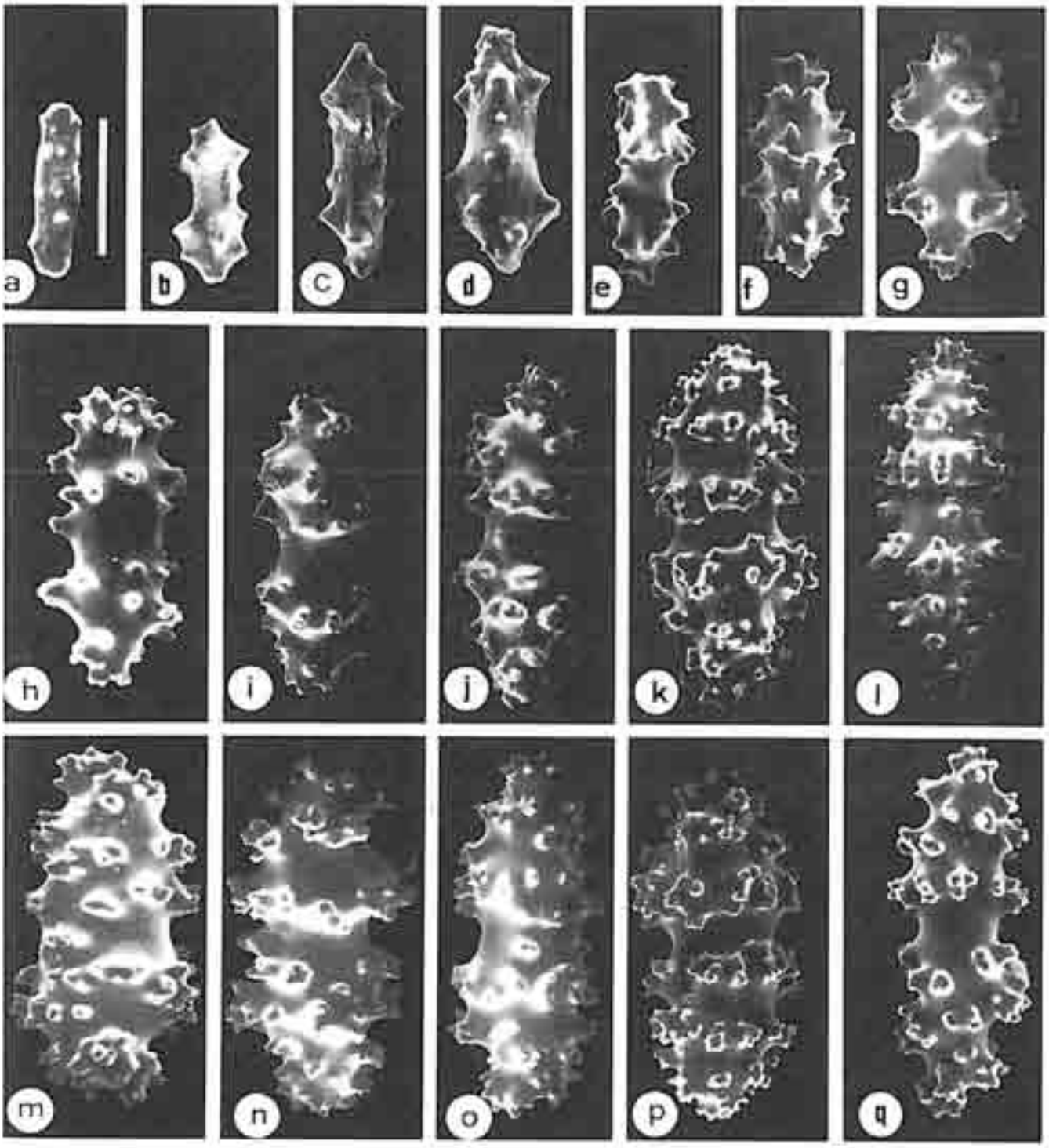


Figure 8. *Cladiella kashmani* spec. nov., holotype (ZMTAU Co 27792), sclerites from the surface of the lobe and its interior. Scale at 8a, 0.1 mm, applies to 8a-q.

Dumb-bells are predominant on the surface of the stalk; some are small and up to 0.13 mm long (Fig. 10a), but the commonest are larger and up to 0.16-0.24 mm long (Fig. 10b-l). There are also capstan-like sclerites resembling tuberculate spindles with a clear waist, and these are up to 0.25 mm long (Fig. 10m-o). We found numerous dumb-bells, 0.18-0.25 mm long, in the interior of the stalk (Fig. 11a-f). In several cases these have a less pronounced waist (Fig. 11a, c). There are also some

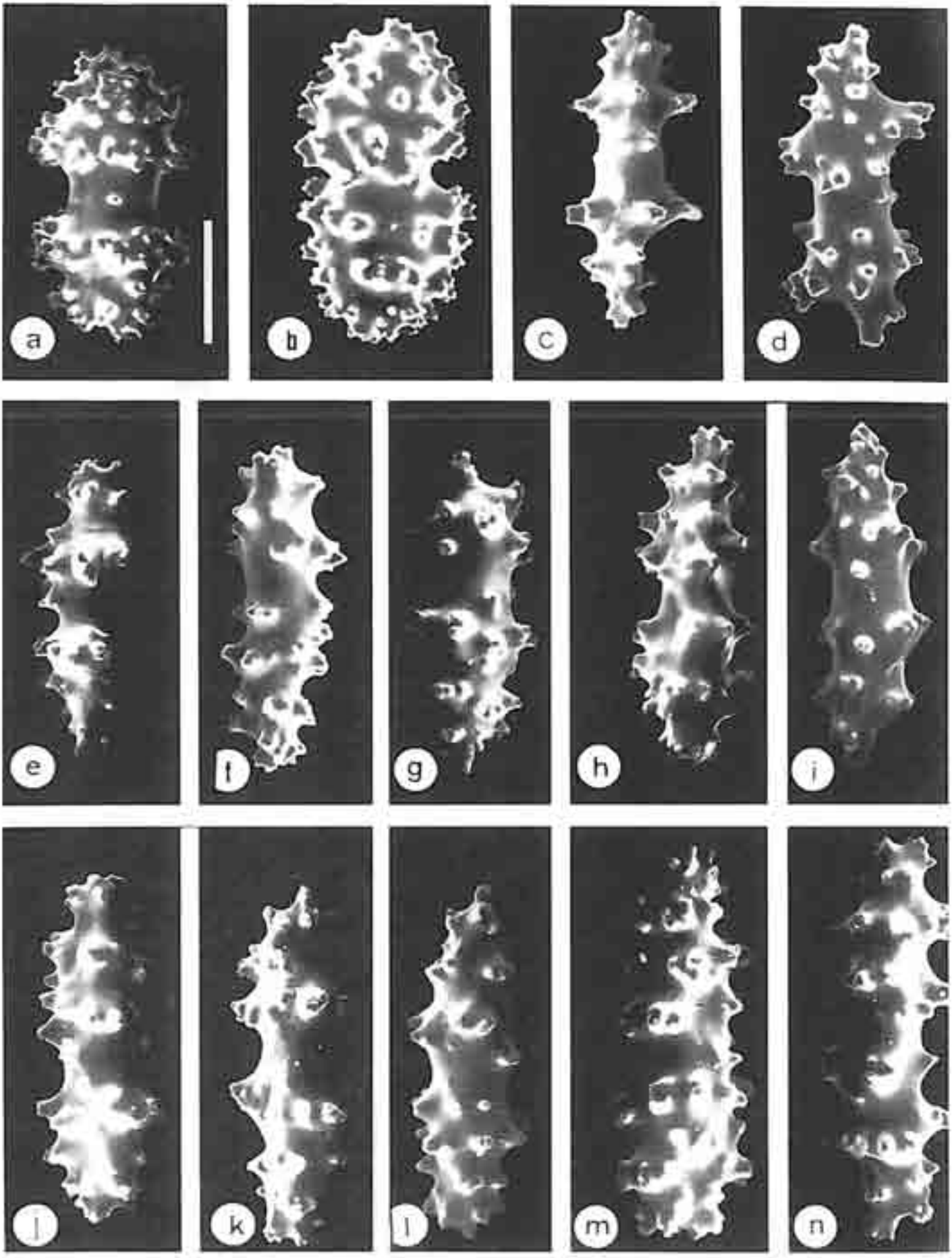


Figure 9. *Cladiella kashmani* spec. nov., holotype (ZMTAU Co 27792), sclerites from the surface of the lobe. Scale at 9a, 0.1 mm, applies to 9a-n.

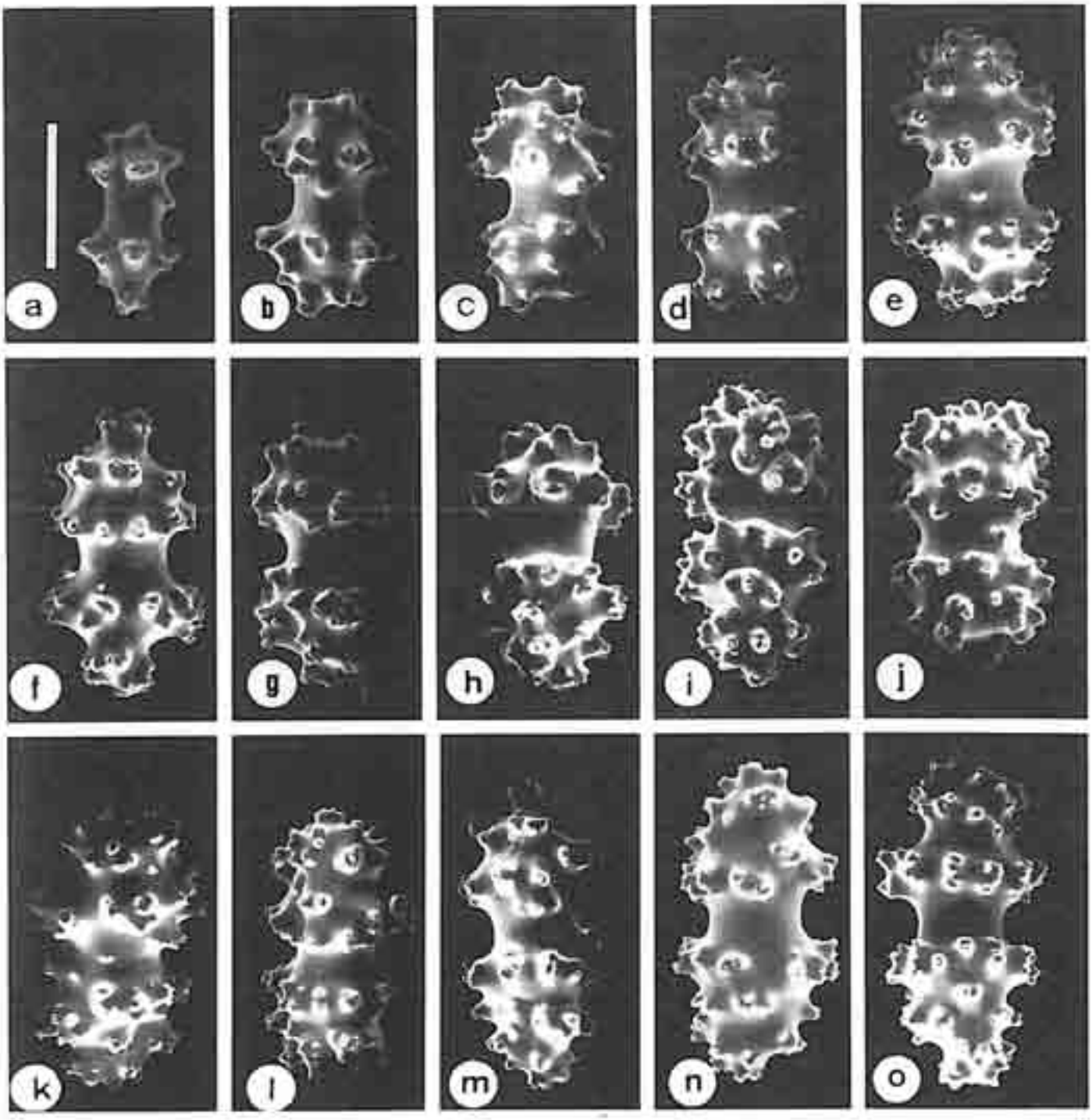


Figure 10. *Cladiella kashmani* spec. nov., holotype (ZMTAU Co 27792), sclerites from the surface of the base. Scale at 10a, 0.1 mm, applies to 10a-o.

more elongated sclerites with a waist, and these are up to 0.28 mm in length (Fig. 11g, h). No sclerites were found in the polyps.

**Colour**

In alcohol the holotype is cream coloured.

**Variability**

The paratypes (Fig. 7b, c) hardly differ from the holotype, except in size.

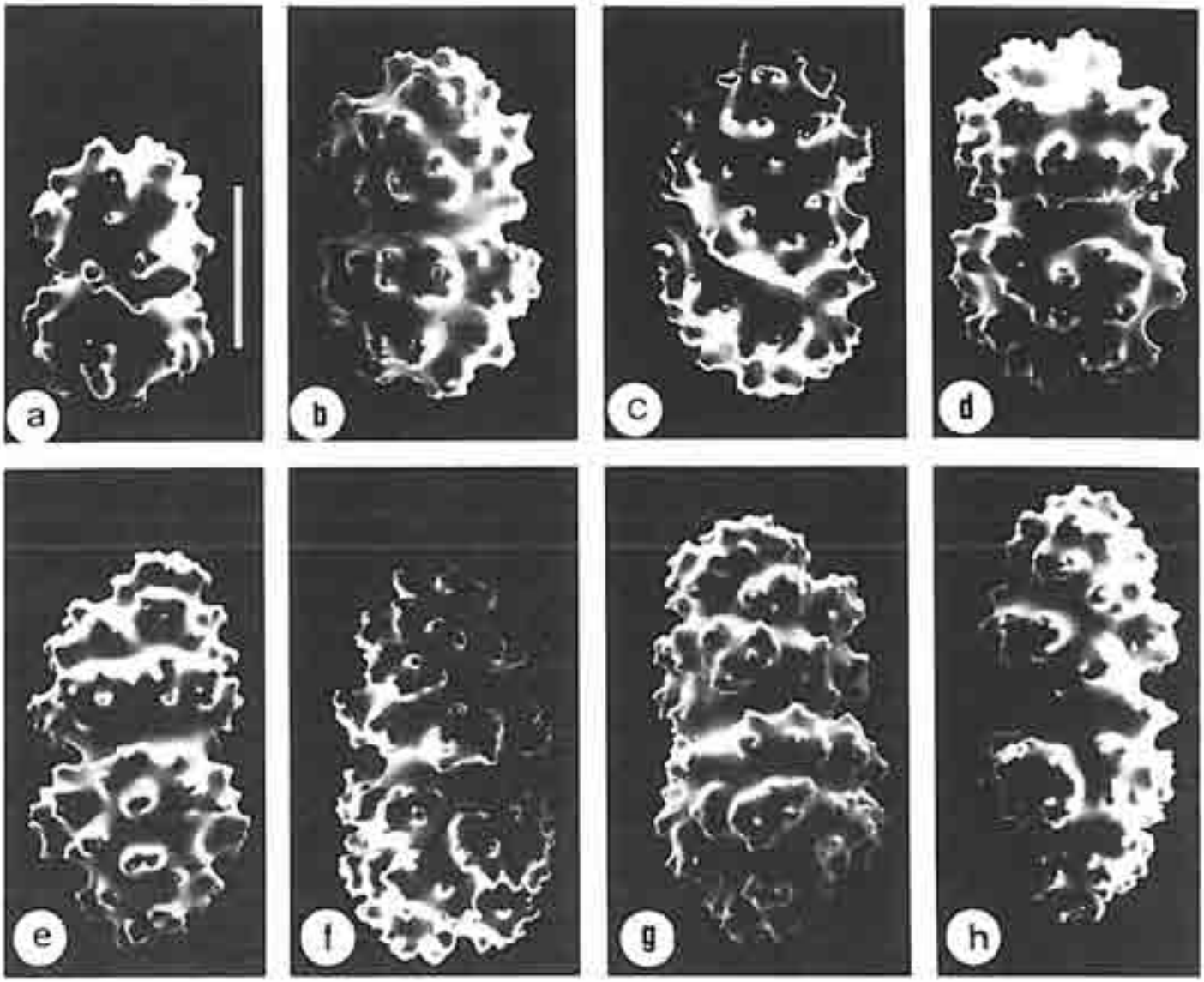


Figure 11. *Cladiella kashmani* spec. nov. holotype (ZMTAU Co 27792), sclerites from the interior of the base. Scale at 11a, 0.1 mm, applies to 11a-h.

**Etymology**

The species is named after Prof. Y. Kashman, School of Chemistry, Tel Aviv University, in appreciation of his tremendous contribution to the study of secondary metabolites in soft corals as well as the many years of fruitful collaboration we have enjoyed with him.

**Remarks**

Prior to this survey, *C. australis* had the largest sclerites amongst the known *Cladiella* species. However, the *Cladiella kashmani* spec. nov. in this study has even bigger sclerites up to 0.37 mm in length. The tuberculate spindles and their dominance in the surface of the lobes are characteristic of *C. kashmani* spec. nov., and are not found in any other *Cladiella* species. It is interesting that both *C. australis* and *C. kashmani* spec. nov., the two *Cladiella* species with the largest sclerites, occur together on the Bazaruto reefs.

Colonies of *C. kashmani* spec. nov. are relatively abundant at Bazaruto Island, occasionally attaining a diameter of 2-3 m (Frontispiece). The expanded polyps of living colonies are dark chocolate brown as a result of numerous zooxanthellae in the anthocodiae (Fig. 12). Polyp retraction occurs almost instantaneously upon disturb-

Figure 12. Colony of *Cladiella kashmani* spec. nov. in its natural habitat with polyps expanded.

Figure 13. Colony of *Cladiella kashmani* spec. nov. in its natural habitat with polyps retracted.

ance of a colony, exposing the white coenenchyme (Fig. 13) after which the colonies appear light grey (Frontispiece, bottom).

**Distribution**

Sodwana Bay, KwaZulu-Natal coast, South Africa and Bazaruto Island Mozambique.

## DISCUSSION

The soft coral fauna of Bazaruto Island comprises 27 species distributed among seven genera of the families Tubiporidae, Alcyoniidae and Xeniidae. The Alcyoniidae are the most common and are represented by 24 (89%) of the species; 2 (7%) belong to the Xeniidae, while the family Tubiporidae is represented by the single species, *Tubipora musica*. All the soft corals obtained in the current study are zooxanthellate and are characteristic of Indo-Pacific coral reef communities (Williams, 1989, 1992).

Qualitative observations made while undertaking the collections indicate that *Cladiella*, *Lobophytum*, *Sarcophyton* and *Sinularia* assemblages are dominant in areas of the reefs inhabited by soft corals. However, such areas are limited and hard corals cover the greater part of the habitable portions of the reefs (Schleyer, in prep.). The soft corals appear to succeed only in the marginal habitats and thus:

1) Shallow, wave-cut platforms are often inhabited by *Cladiella* spp., especially the large colonies of *C. kashmani* spec. nov. described above, and lobate *Sinularia* spp. such as *S. gyrosa* and *S. abrupta*.
2) Sandy areas at the reef-sediment interface have a complement of soft corals that appear tolerant of substantial sediment movement. These include *Sarcophyton* spp. and species with large lobes such as *Lobophytum crassum* and *Sinularia abrupta*.
3) Thin, tough crusts of *Sinularia brassica* and *S. dura* are found on deep, flat shelves overlaid with a fine layer of mobile sediment. Relatively harsh conditions in these areas appear to result from intense turbulence caused by a high frequency of wind-driven, onshore swells of some magnitude (pers. obs. MHS and information from the South African Centre for Oceanography or SADCO).
4) Some species are rare; representatives of the Xeniidae and Tubiporidae had to be actively sought and were only found in a few areas amongst algae in the surf zone.

There are some similarities in composition between the soft coral fauna of Bazaruto Island and Sodwana Bay in northern KwaZulu-Natal, South Africa. All genera encountered on Bazaruto reefs were previously recorded at Sodwana Bay (Benayahu, 1993). Nonetheless, three genera of the Xeniidae, *Efflatounaria*, *Heteroxenia* and *Sympodium*, are found at Sodwana Bay but not at Bazaruto. Of the 41 soft coral species recorded at Sodwana Bay (Benayahu, 1993; Benayahu & Schleyer, 1995; this study) and 27 species listed for Bazaruto, 20 are encountered in both regions.

Bazaruto Island (21° 30'S) is located nearer to the equator than Sodwana Bay (27° 30'S), a site that is characterized by prevailing marginal conditions for reef development (Williams, 1989; Ramsay & Mason, 1990; Schleyer, 1995). The reef

morphology in both areas is fundamentally the same, consisting of a veneer of coral accreted on sandstone originating from submerged, fossilized sand dunes (Dutton, 1990; Ramsay & Mason, 1990). Hard corals from Bazaruto are presently under investigation (Schleyer, in prep.) but are more abundant at this location than at Sodwana Bay, possibly because the sea is warmer by 2° C in the Bazaruto Archipelago (mean seasonal sea surface temperatures at this location range from 24° C in winter to 28° C in summer; SADCO data, 1960-1990). The number of soft coral genera and species on Bazaruto reefs nevertheless seems low compared to the numbers found at Sodwana Bay, even taking the apparent competition from hard corals into account. This is of interest, since it contradicts the notion that the abundance of reef species should decrease with increasing distance from the equator (Achituv & Dubinsky, 1990).

The only other soft coral studies undertaken along the southern part of the east African coast were conducted at Inhaca Island (26° S; Tixier-Durivault, 1960) and at Tanzania (7° S; Ofwegen & Benayahu, 1992). Fourteen and 42 species belonging to the families Alcyoniidae and Xeniidae were recorded in these studies respectively. The limited number of surveys undertaken in this region thus makes it difficult to generalize on gradients in soft coral latitudinal species-richness in this part of the Indo-Pacific basin. There is no doubt that comprehensive studies are needed along the entire east African coast to determine the biogeographic and transequatorial faunistic patterns of the soft coral fauna and to assess the significance of such patterns.

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## REFERENCES


ACHITUV, Y., & DUBINSKY Z., 1990. Evolution and zoogeography of coral reefs. *In:* Dubinsky Z. *(ed.)*. Ecosystems of the world 25. Coral Reefs: 1-8.

BENAYAHU, Y., 1985. Faunistic composition and patterns in the distribution of soft corals (Octocorallia: Alcyonacea) along the coral reefs of Sinai Peninsula. *In:* Proc. 5th Int. Coral Reef Cong. Tahiti., **6**: 225-260.

BENAYAHU, Y., 1990. Xeniidae (Cnidaria: Octocorallia) from the Red Sea, with the description of a new species. *Zool. Med. Leiden*, **64**: 113-120.

BENAYAHU, Y., 1993. Corals of the South-West Indian Ocean I. Alcyonacea from Sodwana Bay, South Africa. *Invest. Rep. Oceanogr. Res. Inst.*, (67): 1-16.

BENAYAHU, Y., 1995. Species composition of soft corals (Octocorallia, Alcyonacea) on the coral reefs of Sesoko Island, Ryukyu Archipelago, Japan. *Galaxea*, **12**: 103-124.

BENAYAHU, Y. & SCHLEYER, M. H., 1995. *Eleutherobia aurea* spec. nov. (Cnidaria, Alcyonacea) from deep reefs on the KwaZulu-Natal coast, South Africa. *Invest. Rep. Oceanogr. Res. Inst.*, (68): 1-12.

DUTTON, T.P. 1989/1990. Report to the Honourable Minister of Agriculture Mozambique on a conservation master plan for sustained development of the Bazaruto Archipelago. 96pp. (Unpublished item).

MACFADYEN, L.M.I., 1936. Alcyonaria (Stolonifera, Alcyonacea, Telestacea and Gorgonacea). *Great Barrier Reef Expedition 1928-29, Scientific Reports Vol. V,* (2): 19-71.

OFWEGEN VAN, L.P. & BENAYAHU, Y., 1992. Notes on Alcyonacea (Octocorallia) from Tanzania. *Zool. Med. Leiden*, **66**: 139-154.

RAMSAY, P.J. & MASON, T.R., 1990. Development of a type zoning model for Zululand coral reefs, Sodwana Bay, South Africa. *J. Coast. Res.*, **6**: 829-852.

SCHLEYER, M.H. 1995. South African coral reef communities. *In*: Cowan, G.I. *(ed.)*. Wetlands of South Africa. Department of Environmental Affairs and Tourism, Pretoria: 137-146.

TIXIER-DURIVAULT, A., 1948. Revision de la famille des Alcyoniidae I. Le genre *Lobularia* Ehrbg (nec Lamarck). *Mem. Mus. Nat. Hist. Nat. Paris (n. ser.)*,**23**: 1-256.

TIXIER-DURIVAULT, A., 1953. Sur quelques Alcyoniidés de Tahiti et des iles Fidji. *Bull. Nat. Hist. Nat. Paris* (*ser.*2)**25**: 311-319.

TIXIER-DURIVAULT, A., 1960. Les octocoralliares de ile Inhaca. *Bull. Mus. Nat. Hist. Nat.*, **32**: 359-369.

TIXIER-DURIVAULT, A., 1970. Les Octocoralliares de Nha-Trang (Vietnam). *Cahiers du Pacifique*, **14**: 116-223.

VERSEVELDT, J., 1973. Octocorallia from north-western Madagascar (Part IIIa-d). *In:* Proc. Kon. Ned. Akad. van Weten, Amsterdam, Ser. C. 69-100: 141-171.

VERSEVELDT, J., 1976. Alcyonacea from the Seychelles. *Rev. Zool. Afr.*, **90**: 497-513.

WILLIAMS, G.C., 1989. A review of recent research on the sublittoral coral reefs of northern Natal with a provisional assessment of findings regarding the distribution of octocorals on Two-Mile reef, Sodwana Bay. *S. Afr. J. Sci.*, **85**: 140-141.

WILLIAMS, G. C., 1992. Biogeography of the octocorallian coelenterate fauna of southern Africa. *Biol. J. Linn. Soc.*, **46**: 351-401.