

A new genus and species of soft coral (Octocorallia: Alcyonacea: Alcyoniidae) from Lord Howe Island, Australia

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Alderslade, P. A new genus and species of soft coral (Octocorallia: Alcyonacea: Alcyoniidae) from Lord Howe Island, Australia.

Zool. Verh. Leiden 345, 31.x.2003: 19-29, figs 1-7.— ISSN 0024-1652/ISBN 90-73239-89-3.

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Key words: Coelenterata; Cnidaria; Octocorallia; Alcyoniidae; Alcyonacea; *Lohowia*; new species; new genus; Australia; Lord Howe Island.

Lohowia koosi, a new species and new genus in the family Alcyoniidae, is described from Lord Howe Island, Australia. The new taxon has dimorphic polyps and a similar morphology to some of the flat, lobe-less nominal species of *Lobophytum*. The new taxon is clearly distinguished, however, by the possession of large, heavily armed autozooids, polypary surface sclerites in the form of large spindles that protrude through the surface, extremely large interior sclerites and base surface sclerites in the form of rods, spindles and ovals.

Introduction

Lord Howe Island, a high island, is the erosional remnant of a 6.9 million-year old shield volcano. The Island is about 10 km long and about 1.5 km wide and is situated in the northern region of the Tasman Sea on the western margin of the Lord Howe Rise. This rise is approximately 320 km wide and 1575 km long and runs in a more or less northwesterly direction from off the South Island of New Zealand. A chain of seamounts extends for about 1000 km northwards from Lord Howe Island far into the coral sea (McDougall et al., 1981).

Lord Howe is about 600 km off the coast of northern New South Wales, and is administratively part of that state. The island region, which is on the UNESCO World Heritage List and incorporates a Marine Park, is surrounded by the southernmost coral reefs in the world, lying beyond 31°S, where the ocean currents have permitted the development of a unique mix of both temperate and tropical faunas. Ponder et al. stated in a 2002 report; "The marine biota of Lord Howe is known to have a number of endemic species in shallow water and on the shelf, but the deeper water fauna is unknown. There has never been a full-scale survey of the marine invertebrates of Lord Howe Island, although there is some information (reviewed by Pollard and Burchmore 1985). By far the best known group is the corals (Veron and Done 1979; Harriott et al. 1993; Harriott et al. 1995; Pichon 1995), ... Harriott et al. (1993) undertook a baseline study to determine the status and structure of the "marine benthic (coral) communities" and compared their findings with published records ... A total of 59 coral species were recorded during their study (including 19 not previously recorded from Lord Howe), bringing the total to 83 species of corals known from the island (c.f. 356 from the GBR), a very high diversity considering the latitude and isolation of the island (Harriott et al. 1993; Harriott et al. 1995). Other groups of marine invertebrates have not been synoptically reviewed and are rather poorly known. For

example, there are five described species of ascidians known from the island but perhaps 50 occur there (P. Mather pers. comm.). A number of endemic marine molluscs are known (Allan and Iredale 1939; Iredale 1940; Ponder 1981)."

The octocorals of the region have never been studied in any detail. The new taxon described below comes from a collection made by natural science author and underwater photographer Neville Coleman. Mr Coleman has made several collections on the Island during his research for a recently published field guide (Coleman, 2002). The material, yet to be identified beyond generic level, is stored in the Museum and Art Gallery of the Northern Territory (MAGNT) and includes species of; *Tubipora*, *Sinularia*, *Sarcophyton*, *Lobophytum*, *Cladiella*, *Rhytisma*, *Eleutherobia*, *Lemnalia*, *Dendronephthya*, *Xenia*, *Sympodium*, *Briareum*, *Erythropodium*, *Mopsella*, and *Acabaria*.

The abbreviation NTM refers to Museum and Art Gallery of the Northern Territory, Darwin.

Systematic part

Family Alcyoniidae Lamouroux

Lohowia gen. nov.

Type species.— *Lohowia koosi* spec. nov. by original designation.

Diagnosis.— Colony low, massive and encrusting. Polypary without lobes, and slightly dished. Polyyps dimorphic. Autozooids relatively large, retractile, and heavily armed with spindles in a collaret and points arrangement. Polyp tentacles with rows of numerous fattened rods. Siphonozooids with a few short rods or double cones that commonly have a waist and tuberculate ends. Surface of the polypary contains a thick, dense layer of short to long, narrow spindles that are arranged perpendicular to the surface. The tips of many of these spindles protrude through the surface and form a row around the siphonozooids and autozooids. The surface of the base contains a thin layer of short rods, tuberculate spindles and ovals arranged in all directions. The colonial interior contains short to very large (up to 4 mm), longitudinally arranged spindles with spiny tubercles. Zooxanthellate.

Etymology.— The name is derived from the type location, Lord Howe Island, and is feminine.

Remarks.— In several respects, *Lohowia* gen. nov. resembles the genus *Lobophytum* (Marenzeller, 1886). The latter is dimorphic, low, massive and encrusting, and includes several nominal species with a more or less lobe-less polypary (e.g. *L. patulum* Tixier-Durivault, 1956, *L. variatum* Tixier-Durivault, 1957 and *L. depressum* Tixier-Durivault, 1966, see colony pictures in Verseveldt, 1983). In *Lobophytum*, however, the autozooids are relatively small and are only lightly armed with small rods, the surface of polypary and the base contain a thin layer of small clubs, the sclerites in the polypary surface do not protrude, and the interior of the colony contains small spindles or ovals, rarely longer than 0.5 mm, which have large tubercles generally arranged in a small number of girdles.

Given the high latitude of Lord Howe Island (31°S), it is worth also noting the similarities between the new taxon and *Skamnarium* Alderslade, 2000 which is only known from 32°S off the west coast of Australia. *Skamnarium* also forms colonies with



Fig. 1. *Lohowia koosi* gen. nov., spec. nov.; aspects of the holotype. Life size $\times 2$.

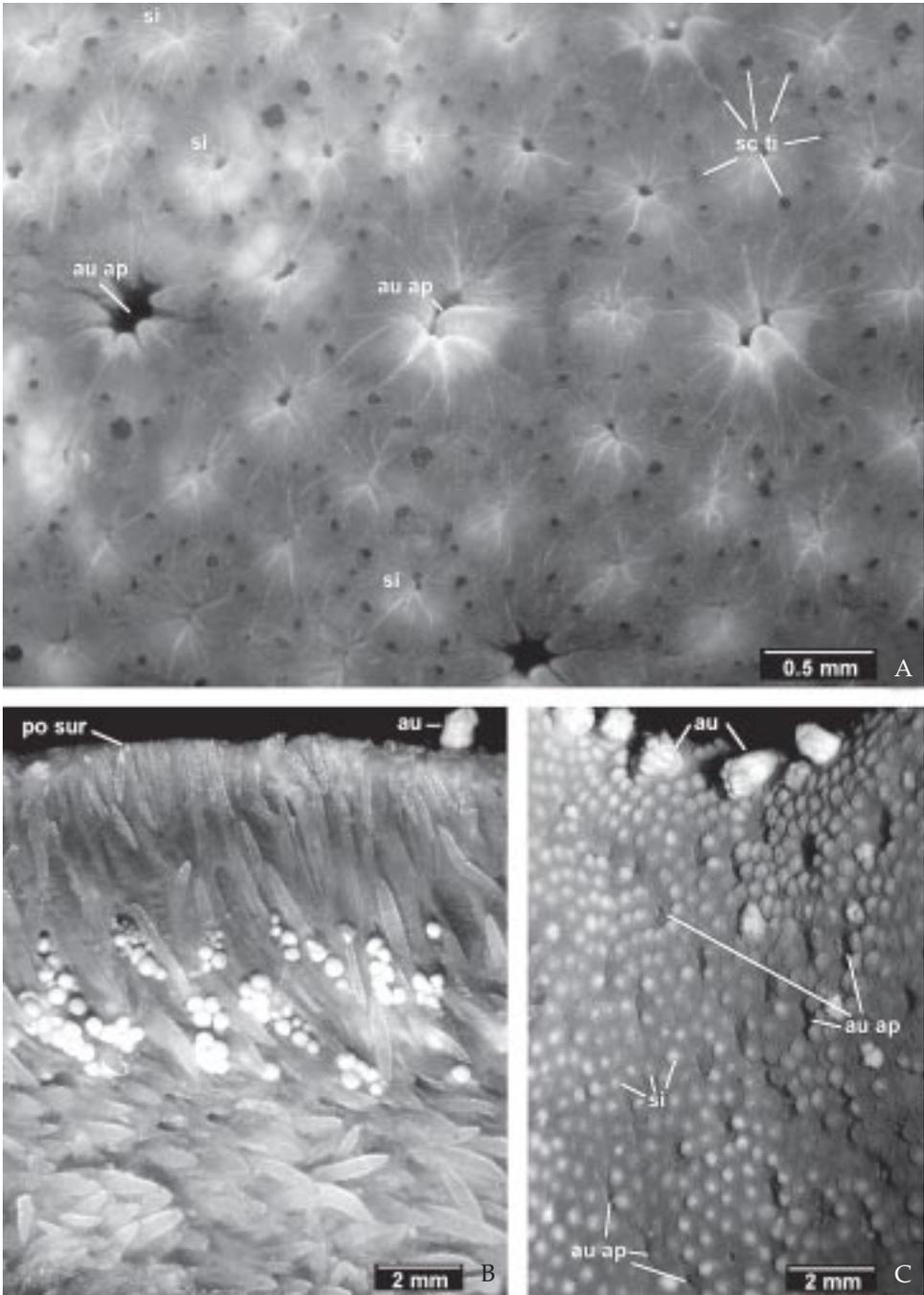


Fig. 2. *Lohowia kooi* gen. nov., spec. nov.; holotype; A, polypary surface; B, broken face of colony; C, polypary surface. Abbreviations: au = autozooid; au ap = autozooid aperture; po sur = polypary surface; sc ti = sclerite tips; si = siphonozooid.

a flat or dished polyparium and the coenenchyme contains large tuberculate rods up to 4 mm in length. However, the polyps are monomorphic and unarmed, and there are no separate surface layers of sclerites in any region of the colony.

Lohowia koosi spec. nov.
(figs 1-7)

Material.— Holotype NTM C14232, No Name Rock, Lord Howe Island, 31°33'S, 159°05'E, depth 13 m, Neville Coleman, 17.vii.2002.

Description of holotype.— The holotype (fig. 1) is a portion torn from the original colony. It is 66 mm long and 20-35 mm across. The greatest thickness is 20 mm in a region where the base is 15 mm tall. The polypary has a dished surface and there are no lobes or ridges. The cross section exposed by the sampling (fig. 2B) clearly shows the densely packed interior sclerites, the layer of smaller surface sclerites, and clusters of oocytes (0.14-0.44 mm in diameter) in the mid-to-lower regions of the gastric canals of the autozooids.

The polyps are dimorphic, and the siphonozooids and the apertures left by the retracted autozooids are clearly visible. On the curved rim of the polypary there are about 0-3 siphonozooids between two autozooids. In the central region near the cut edge the number is 1-6 between two autozooids. Most siphonozooids are completely deflated (fig. 2A), but in the central region of the sample, especially close to the torn edge, many remain relatively well inflated and appear as low domes about 0.4 mm across (fig. 2C).

The apertures left by retracted autozooids, together with their octate surround (fig. 2A), are up to about 1.25 mm in diameter. Several autozooids in the vicinity of the torn edge are exert (fig. 2B, C) and these are up to 1.5 mm tall and 0.9 mm in diameter.

Autozooid polyps are heavily armoured with sclerites in a collaret and points

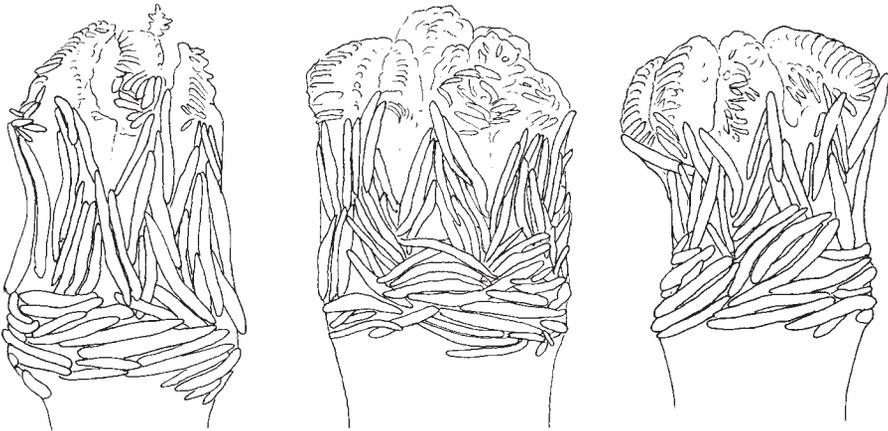


Fig. 3. *Lohowia koosi* gen. nov., spec. nov.; holotype; examples of the arrangements of polyp sclerites.

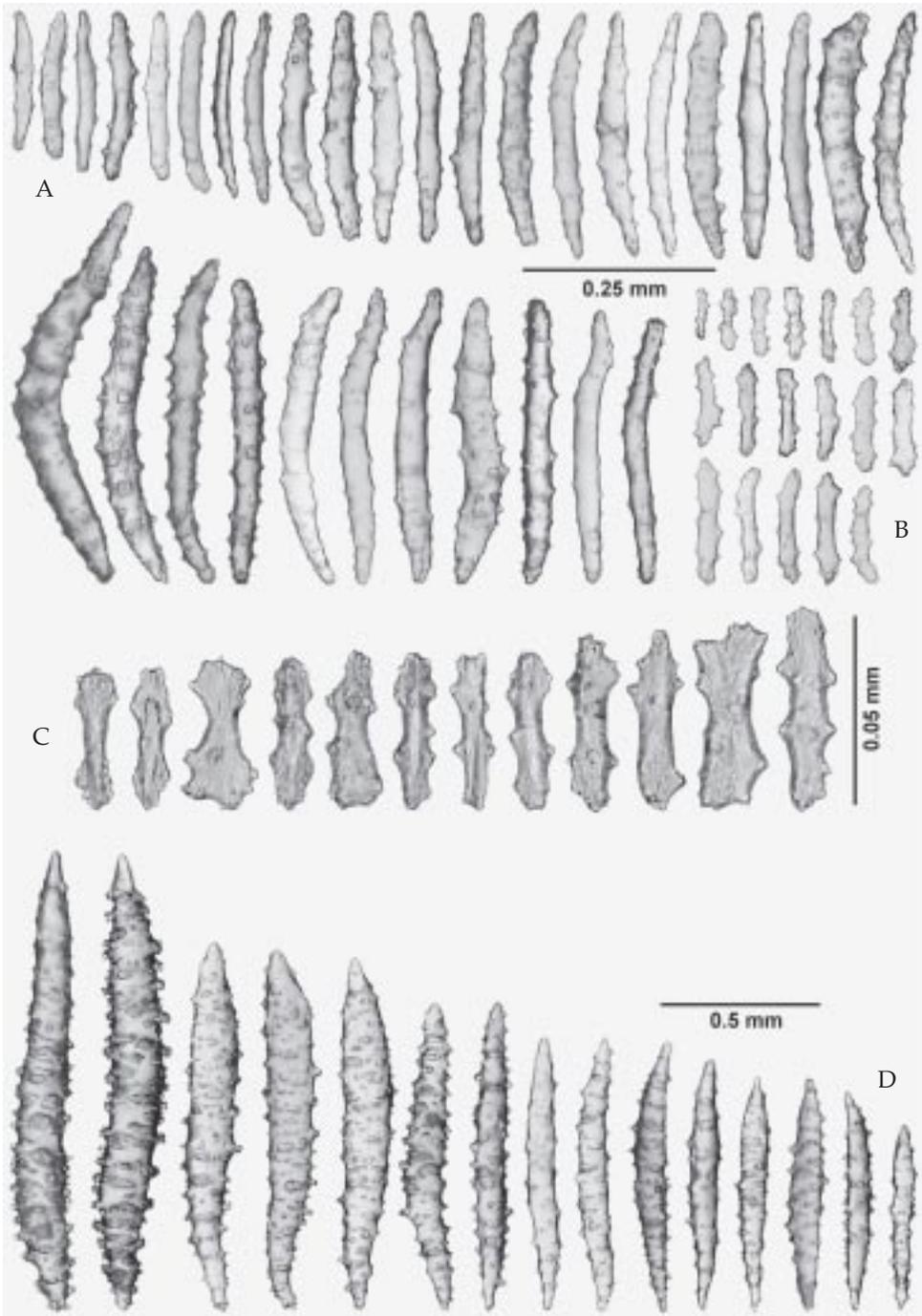


Fig. 4. *Lohowia koosi* gen. nov., spec. nov.; holotype; A, polyp head sclerites; B, tentacular sclerites; C, siphonozooid sclerites; D, polypary surface sclerites.

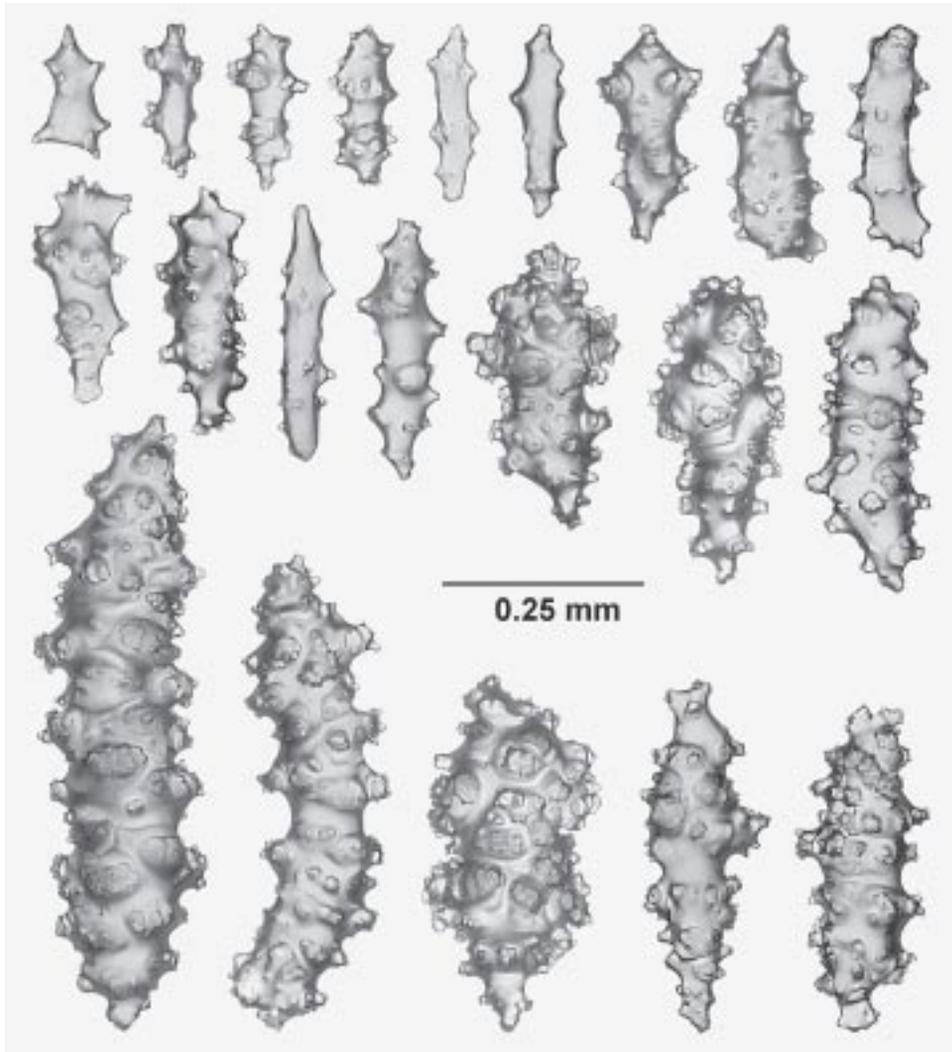


Fig. 5. *Lohowia koosi* gen. nov., spec. nov.; holotype; basal surface sclerites.

arrangement (fig. 3). The sclerites are spindles or rods, mostly slightly curved, which are ornamented with cone-shaped tubercles (fig. 4A). The sclerites are about 0.16-0.5 mm in length and their number and arrangement is very varied. The tentacles contain flattened rods (fig. 4B) about 0.05-0.19 mm long. They would probably align in a single row in an expanded tentacle rachis, but in the holotype's contracted tentacles they are arranged both obliquely and transversally.

The siphonozooids also contain a few sclerites. They are small rod-like forms, 0.04-0.06 mm long, that often have the simple tubercles clustered on the enlarged ends (fig. 4C). They can be seen in a number of the inflated siphonozooids arranged like small spokes around the centre point. There is commonly 1-2 in each octant.

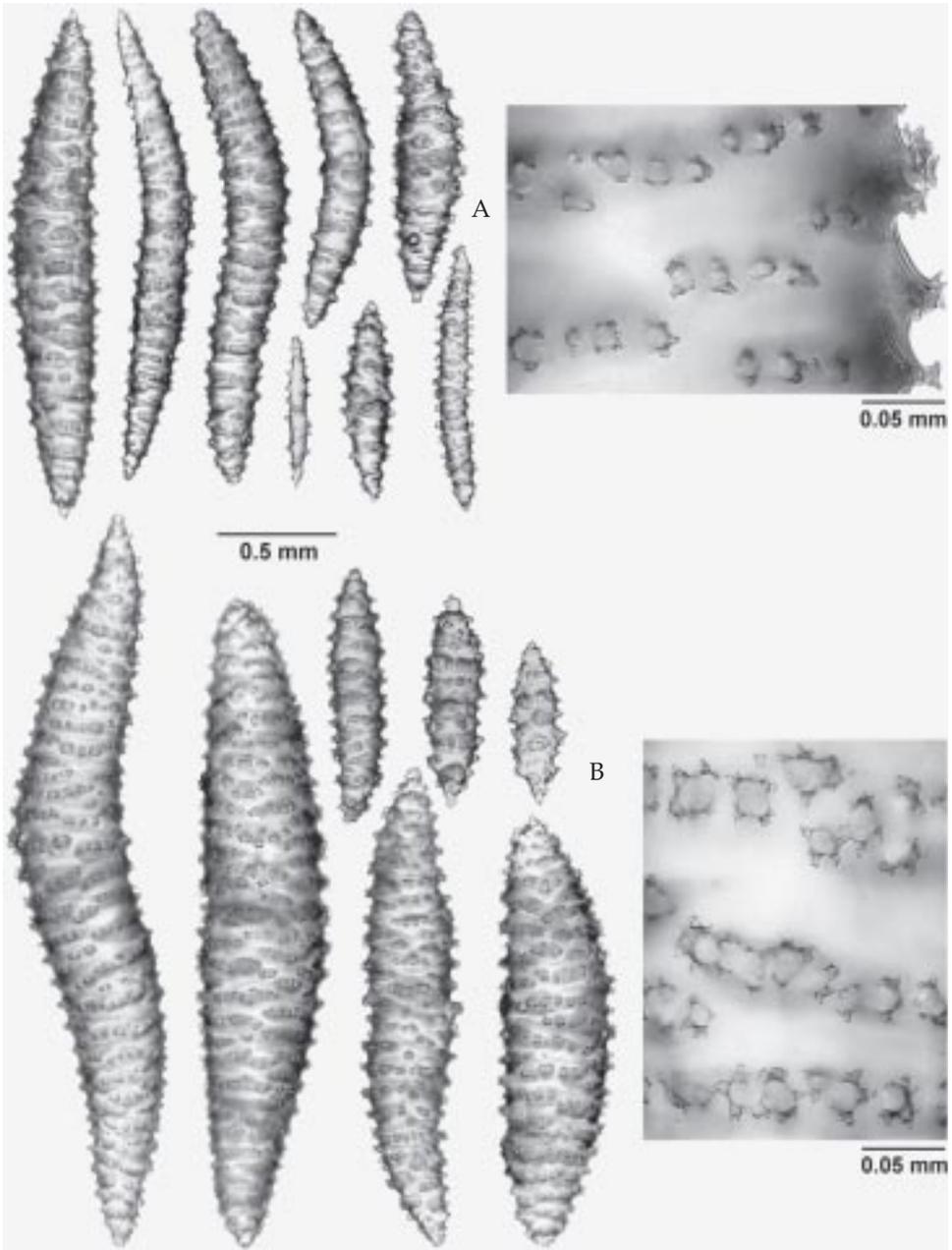


Fig. 6. *Lohowia koosi* gen. nov., spec. nov.; holotype; A, sclerites of interior of polypary with details of tubercles; B, sclerites of interior of base with detail of tubercles.

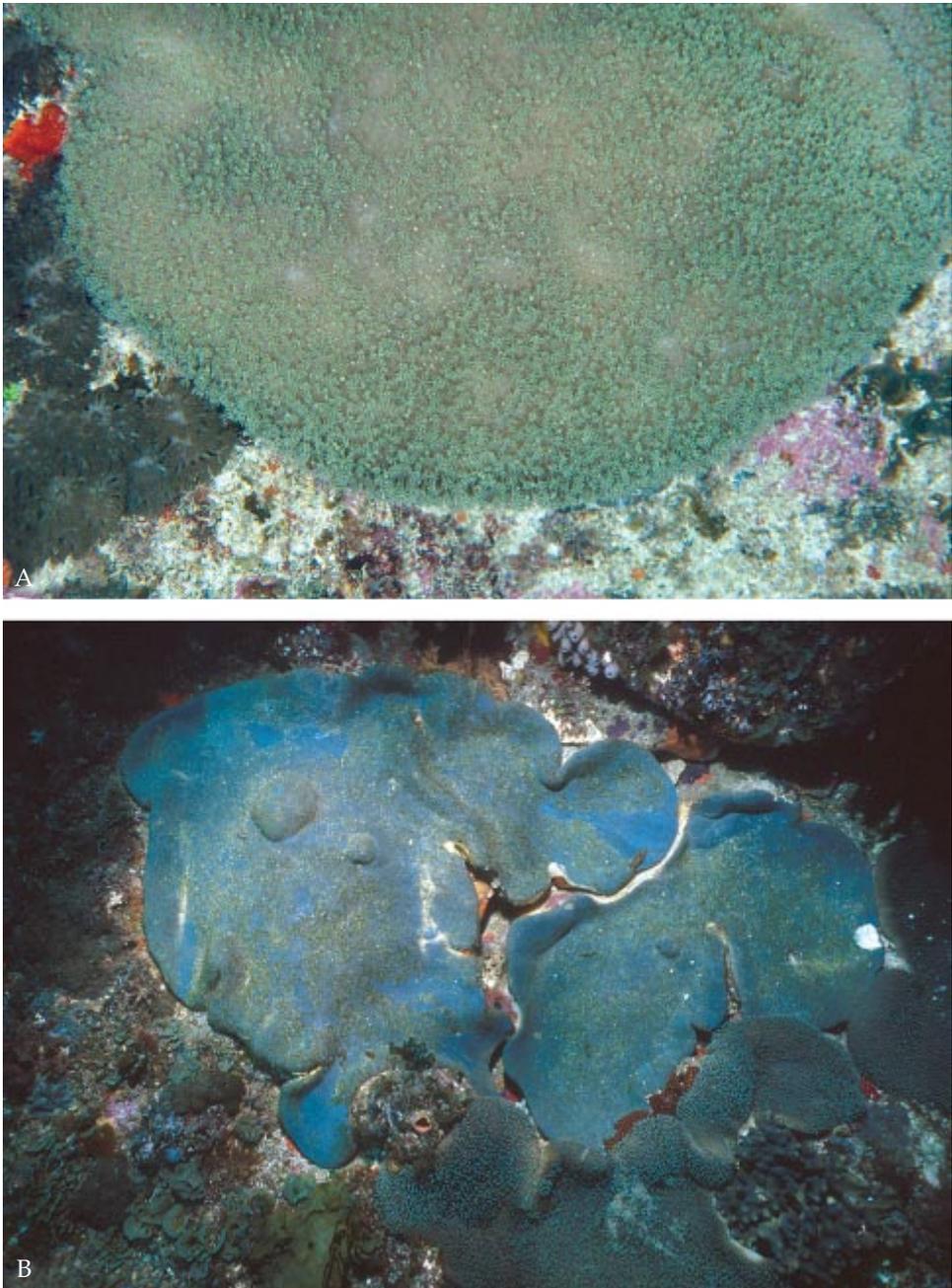


Fig. 7. *Lohowia kosi* gen. nov., spec. nov. A, live colony from which the holotype was removed; B, portion of a group of fission clones, about 1.5 m cross, suspected of being this species. Photographs by Neville Coleman.

The surface layer of the polypary contains spindles about 0.6-1.5 mm long that have one, smooth, roundly pointed end (fig. 4D). The remainder of the sclerite is ornamented with short, transverse rows of spiny tubercles like those that occur on the interior sclerites (see fig. 6). The spindles are arranged perpendicular to the surface and their smooth distal end protrudes through the coenenchyme forming circles around the polyps (fig. 2A).

In the surface layer of the base, more or less nestled between the outermost interior sclerites below a soft "dermal" layer, there are numerous small sclerites. They are rods, spindles and ovals that are commonly 0.16-0.77 mm in length (fig. 5). Most are ornamented with large, complex tubercles.

The interior of the holotype contains large, densely packed, spindles up to about 4 mm in length. They are ornamented with spiny tubercles arranged in short transverse rows. The spindles in the basal region are the largest and have the largest tubercles (fig. 6B). Those in the polypary are shorter and narrower and have smaller tubercles (fig. 6A).

Colour.— The holotype is violet-brown; paler in the exposed part of the colony interior. This colour is clearly a stain derived from another organism, probably a sponge, kept in the same container during preservation, and does not penetrate deeply into the coenenchyme. The colony from which the holotype sample was removed can be seen in fig. 7A. It has the general appearance of greenish grey polyps over a brownish grey surface that is seen in many species of such alcyoniid genera as *Lobophytum*, *Sarcophyton* and *Sinularia*. The colonies pictured in Fig. 7B, photographed at Roach Island, which is just over one kilometre to the NE of Lord Howe Island, are thought by Neville Coleman to also represent the new species. With the polyps retracted the fission clones have a definite bluish hue.

Etymology.— Dr Jacobus Cornelis den Hartog was known to friends and colleagues as Koos, and the new species is named in his honour. I can still recall my first meeting with Koos more than two decades ago when visiting the Leiden Museum for octocoral research. Unable to secure reasonable priced accommodation for my family, Koos and his lovely wife Ruth unselfishly invited us to lodge at their house. We remained in periodic contact from that time until his passing.

Acknowledgements

I offer my sincere thanks to Neville Coleman for donating his collected material to the MAGNT and for allowing the publication of his underwater photographs. My thanks also to Leen van Ofwegen for his invitation to contribute to this dedicatory volume and for his comments on my draft manuscript.

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