

Trichogorgia insulaeuropensis spec. nov., a new gorgonian from the Southern Indian Ocean (Coelenterata: Octocorallia: Alcyonacea: Chrysogorgiidae)

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Weinberg, S. *Trichogorgia insulaeuropensis* spec. nov., a new gorgonian from the Southern Indian Ocean (Coelenterata: Octocorallia: Alcyonacea: Chrysogorgiidae).

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A new species of gorgonian, *Trichogorgia insulaeuropensis*, is described from the reef drop-off of Europa Island in the Mozambique Channel. The species is closely related to *T. flexilis* Hickson, 1904, known from South Africa and the two are compared. The problematic status of a third species, *T. capensis* (Hickson, 1904) is discussed.

Une nouvelle espèce de gorgonaire, *Trichogorgia insulaeuropensis*, est décrite du tombant récifal de l'île Europa dans le Canal du Mozambique. Cette espèce possède des points communs avec *T. flexilis* Hickson, 1904, connue d'Afrique du Sud. Une comparaison des deux est donnée et le statut problématique d'une troisième espèce, *T. capensis* (Hickson, 1904) est évoqué.

Introduction

In May, 2013, the scientific cruise "ORCIE 2013" took place in the Southern Indian Ocean. The aim of the expedition was to survey the scleractinian corals on the virtually undisturbed reefs around Europa Island, roughly situated halfway between Mozambique and Madagascar in the Mozambique Channel, and part of the TAAF. Coral samples were taken at 14 different dive sites around the island. At two of them, both

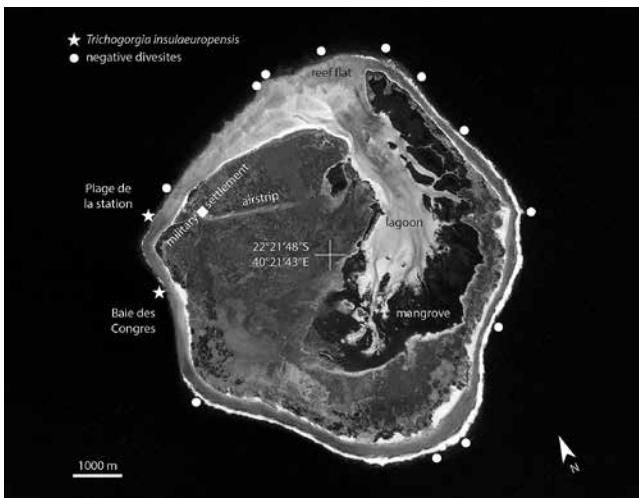


Fig. 1. Satellite picture of Europa Island showing the different dive sites and the type locality of *Trichogorgia insulaeuropensis* spec. nov. (★).

situated around the westernmost tip of the island (fig. 1), dense populations of a tiny gorgonian were observed between 15 and 45 m depth and some samples were collected. Due to the restrictions of SCUBA diving in the area, it was impossible to establish the lower limit of the populations, but they seem to extend well beyond 45 m. The unusual small size and bushy appearance of these gorgonians prompted further investigation.

Abbreviations used

- MNHN: Muséum National d'Histoire Naturelle, 57 rue Cuvier, 75005 Paris, France
ORCIE: Observatoire du Réchauffement Climatique aux Îles Éparses
RMNH: Naturalis Biodiversity Center, formerly Rijksmuseum van Natuurlijke Historie, Darwinweg 2, 2333 CR Leiden, The Netherlands
TAAF: Terres Australes et Antarctiques Françaises

Systematics

Genus *Trichogorgia* Hickson, 1904. Type species *Trichogorgia flexilis* Hickson, 1904 by designation.

Trichogorgia insulaeuropensis spec. nov.
(figs 2-9)

Material examined.— Holotype: RMNH Coel. 41479, collected in 20 m depth at Europa Island, 22°20'30.78"S 040°20'03.48"E, S. Weinberg, 08.v.2013. Paratypes RMNH Coel. 41480, collected between 20 and 40 m depth at 22°20'31.62"S 040°20'03.18"E, S. Weinberg, 12.v.2013; MHNH-IK-2012-14003 and MHNH-IK-2012-14004, same data.

Description.— The holotype (figs 2B, 3) is 43 mm high, 63 mm wide and 37 mm deep. The very short stem has a diameter of approximately 0.7 mm and starts dividing pseudo-dichotomously after some 4-5 mm. After about 10 mm the branches (still devoid of polyps) have divided four to seven times (fig. 4). The terminal branchlets that bear the polyps measure 25-35 mm long and account for about two-thirds of the colony.

All branches are very thin: main branches around 0.3 mm; terminal branchlets about 0.15 mm towards the tips. The diameter of the horny axis, visible through the transparent coenenchyme (fig. 5), measures 0.06 to 0.17 mm (fig. 5).

The polyps are situated on opposite sides of the branches, usually alternating (fig. 5). When contracted (as in the preserved specimens), they are clavate and between 0.5 and 1 mm tall. They are stiffened by a dense girdle of flat sclerites (fig. 6). When expanded (in living specimens, see fig. 2), the polyps are up to 10 mm tall, the tentacles being about 10 mm long, each bearing 10-12 pairs of pinnules.

The polyp sclerites are of two types; scales and rodlets. The scales (figs 6, 7, 9) vary in length from 20-120 µm (average of 89 sclerites measured: 70.8 µm) and in width from 8-33 µm (average: 18.4 µm). The average length to width ratio is 3.85 µm. The rodlets (figs 8-9) are often slightly dumbbell-shaped with fine denticulations. They measure from 20-95 µm in length (average of 65 sclerites: 39.1 µm) and 4-10 µm in width (average: 6.1 µm). Their average length to width ratio is 6.4.

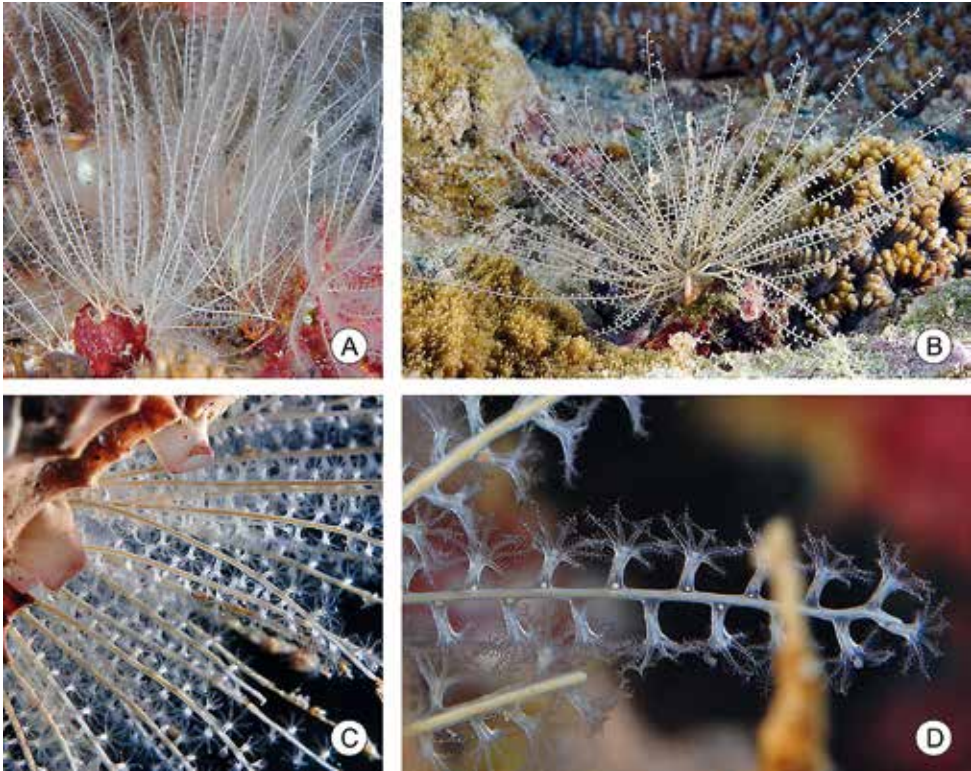


Fig. 2. *In situ* underwater photographs of *Trichogorgia insulaeuropensis* spec. nov.: A, dense population of several colonies; B, holotype, RMNH Coel. 41479, showing the short, plump stem, from which long, slender and sparsely dividing branches extend in all directions; C, detail of the branches, of a colony with the polyps alternating on opposite sides; D, detail of one colony's extended polyps, a single ovum present in most of them.

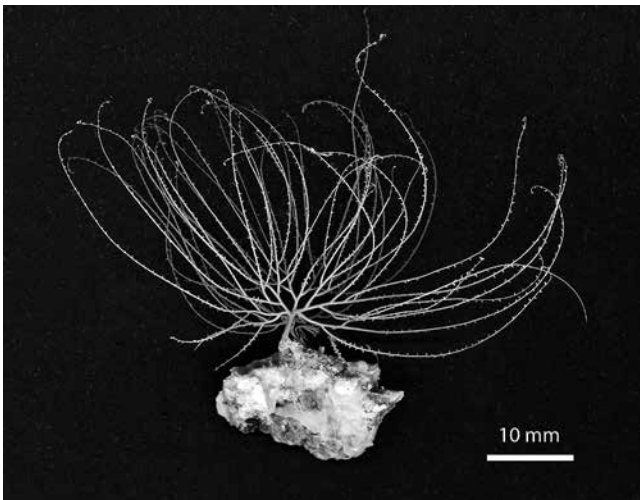


Fig. 3. *Trichogorgia insulaeuropensis* spec. nov., holotype, RMNH Coel. 41479.

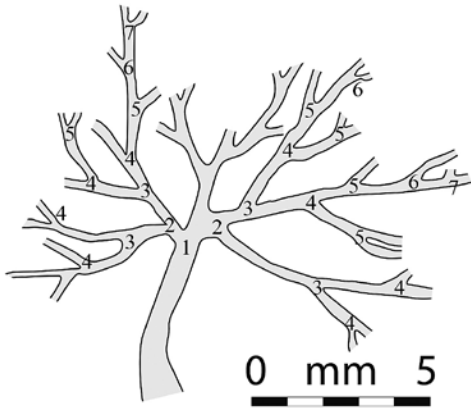


Fig. 4. Branching of the basal part of the holotype of *Trichogorgia insulaeuropensis* spec. nov., RMNH Coel. 41479. Numbers 1-7 indicate the orders of branching.



Fig. 5. *Trichogorgia insulaeuropensis* spec. nov., paratype RMNH Coel. 41480. Detail of a middle branch and an end branch.

There are no sclerites in the coenenchyme (fig. 6).

Colour. — The colony is dirty white.

Etymology. — The species name *insulaeuropensis* is derived from Insula Europa, the Latin name for Europa Island, the type locality.

Distribution. — So far, the species is known only from Europa Island.

Variability. — The colonies are 20-77 mm long (average of 15 colonies: 43 mm), 24-95 mm wide (average 51 mm) and 6 mm (almost planar) to 37 mm (very bushy) deep



Fig. 6. *Trichogorgia insulaeuropensis* spec. nov., paratype RMNH Coel. 41480. Detail of a branch after dissolution of the soft tissues in sodium hypochlorite. Only the axis (black) and the sclerites of two polyps are visible.

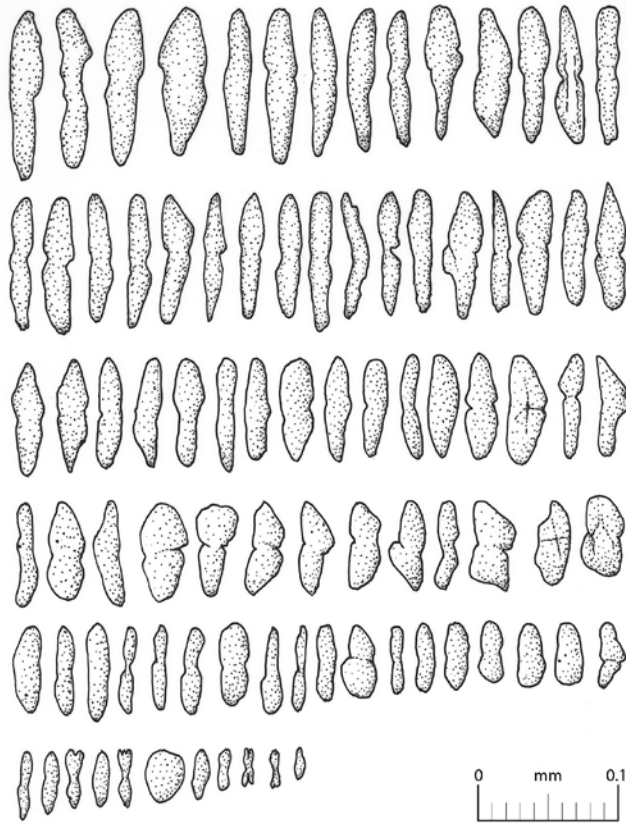


Fig. 7. *Trichogorgia insulaeuropensis* spec. nov., paratype RMNH Coel. 41480: scales from the polyps.

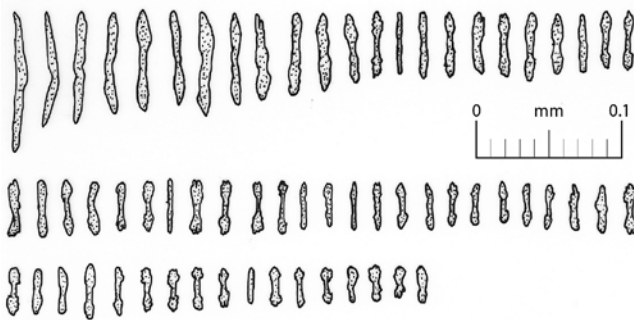


Fig. 8. *Trichogorgia insulaeuropensis* spec. nov., paratype RMNH Coel. 41480: rodlets from the polyps.

(average 20 μm). Branching is pseudo-dichotomous, but very sparse and not in a single plane most of the time, but rather three-dimensional, the average width/depth ratio being 2.55.

Remarks. — The specimens belong to the Family Chrysogorgiidae Verrill, as defined by Bayer & Muzik (1976: 67): "Gorgonaceans having an unjointed scleroproteinous axis. Axis branched or unbranched, arising from a rootlike discoidal base that is usually strongly calcified. Sclerites usually present in the coenenchyme, in the form of flat, oval



Fig. 9. *Trichogorgia insulaeuropensis* spec. nov., holotype RMNH Coel. 41479, SEM pictures of sclerites from the polyps: Top rows scales; bottom row, rodlets.

or elongate scales with or without a median constriction and sometimes terminally lobate, and/or fusiform rods with prickly sculpture; scales showing irregular concentric bands of interference color in polarized light". If their key to the genera of the family Chrysogorgiidae is followed, because the colonies of the new species are not branched in one plane, the resulting diagnosis is the genus *Metallogorgia*, which clearly does not correspond to the specimens described above. Therefore, in order to accommodate the new species, the definition of the genus *Trichogorgia*, as diagnosed by Williams (1992: 268) should be slightly altered as follows (my additions in bold characters): "Colonies lyrate, flabellate, and planar **or bushy**, with secondary branching **pseudo-dichotomous**. Length of terminal branches often one third to **two thirds** of the total colony length. Sclerites when present are ovoid scales, **sometimes in combination with rodlets**."

The genus *Trichogorgia* was established by Hickson (1904: 222-223, 226-227, Pl. VII, VIII, IX) for *Trichogorgia flexilis*, a species from South Africa. Other species of the genus include *T. capensis* (also South Africa), *T. viola* Deichmann, 1936 (Western Atlantic) and *T. lyra* Bayer & Muzik, 1976 (Caribbean). Going by the recent description of *T. flexilis* given by Williams (1992: 268-270), there is a very close resemblance of that species to *Trichogorgia insulaeuropensis* spec. nov. As both species also have a relative close geographical proximity, a detailed comparison of the species is needed and is given in Table 1.

Table 1. Comparison of *Trichogorgia flexilis* and *T. insulaeuropensis* spec. nov.

	<i>Trichogorgia flexilis</i>	<i>T. insulaeuropensis</i>
Colony height	70-90 mm	20-77 mm
Colony shape	planar	bushy
Sclerites present in	coenenchyme and polyps	polyps only
Length of scales	40-170 μm (average: 122 μm)	20-120 μm (average: 71 μm)
Average length/width ratio of scales	3.15 (average of 11 sclerites in Williams, 1992: fig. 62)	3.85 (average of 89 sclerites in fig. 7 above)
Geographical distribution	Cape Recife to Cape Vidal, South Africa	Europa Island
Depth range	24-183 m	15-45 m (and beyond)

The main differences between the two species are therefore the following: colony size (*T. flexilis* seems to be a bit taller than *T. insulaeuropensis*), colony shape (planar vs. bushy), size of the scales (about 50% larger in *T. flexilis*), shape of the scales (more elongate in *T. insulaeuropensis*). The fact that these differences are rather minor can probably be explained by the relatively close geographical proximity of the two species. Fig. 10 shows the distribution range of both. Being separated by the deep water of the Mozambique Channel and the northernmost locality of *T. flexilis* being located at approximately 1,000 km from the type locality of *T. insulaeuropensis*, both probably originated from the same mother population and have evolved only slightly since the two populations became separated. Since the characteristics of both species differ only slightly, the possibility remains that the South African populations are highly variable and their characteristics might turn out to overlap with those of the new species, in which case the latter would prove to be invalid. In this light, it seems vital to collect more specimens from the South African populations.

There remains one more species to be considered, *Trichogorgia capensis*, which was also described by Hickson (1904), but under the name *Malacogorgia capensis*. It was found in Algoa Bay (Port Elizabeth), South Africa, just a few kilometers away from the

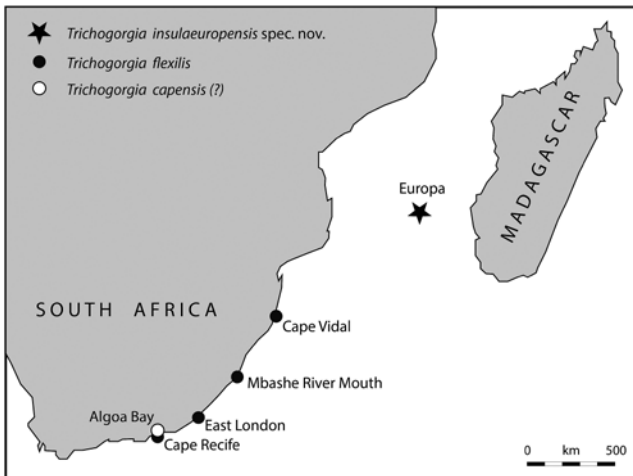


Fig. 10. Map showing the distribution of the species mentioned in this paper.

type locality of *T. flexilis* (Cape Recife) and described as being “identical to *T. flexilis*, except that it completely lacks sclerites” (Williams, 1992: 270). Because *T. capensis* has never been found since 1904, the possibility should be considered that Hickson’s specimen originally had sclerites but that it had been preserved in formalin, resulting in their dissolution and leading to the erroneous establishment of a new species. Hickson himself, when describing the species, considered this possibility, then ruled it out upon microscopical examination which revealed no empty spaces where spicules would have been dissolved (Hickson, 1904: 226). But the sclerites of *T. flexilis* are so extremely thin, that he could easily have missed any empty spaces if they were present. It would be interesting to look again for specimens of *T. capensis* (if the species exists at all) in the waters around Port Elizabeth, South Africa.

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References

- Bayer, F.M. & K.M. Muzik, 1976. New genera and species of the holaxonian family Chrysogorgiidae (Octocorallia: Gorgonacea). — Zoologische Mededelingen 50 (5): 65-90, pls. 1-7.
- Deichmann, E., 1936. The Alcyonaria of the western part of the Atlantic Ocean. — Mem. Mus. Comp. Zool. Harvard, 53: 1-317, pls. 1-37.
- Hickson, S.J., 1904. The Alcyonaria of the Cape of Good Hope. Part II. — Marine Invest. S. Africa, 3: 211-239, pls. 7-9.
- Williams, Gary C. 1992. The Alcyonacea of southern Africa. Gorgonian Octocorals (Coelenterata, Anthozoa). Annals of the South African Museum 101(8): 181-296.

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