

A new genus of soft coral (Octocorallia: Alcyonacea: Clavulariidae) from Chile

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Abstract

Incrustatus comauensis n. gen. & n. sp. (Octocorallia: Clavulariidae) is described from Chile. It occurs in shallow water from Concepción to the southern fjord region. The genus forms stolons on mytilid shells and rocks, or encrusting sheets on *Crepidula* shells (Gastropoda), polychaete tubes, gorgonians, and other substrata. The sclerites of the new taxon are 8-radiates and derivatives of these. The polyps are unarmed or possess a few irregularly arranged spindles. The new genus is compared with another taxon that forms encrusting sheets or stolons.

Key words: Coelenterata, Cnidaria, Octocorallia, Alcyonacea, Clavulariidae, benthos, *Incrustatus*, new genus, new species, Chile

Introduction

The shallow water soft coral fauna of the Chilean coast is still almost completely unknown. To date one stoloniferous species has been described from Chile, *Clavularia magelhaenica* Studer, 1878, from the Straits of Magellan. From 1997 onwards, Verena Häussermann and Günter Försterra investigated the anthozoan fauna of Chile, with a focus on the South Chilean fjord region, and collected many specimens. This soft coral collection includes several undescribed species of *Alcyonium*, a species of *Renilla*, and some possible clavulariids, among which was an as yet undescribed new genus that is the subject of this paper.

Based on colony form and sclerites it was obvious that the Chilean material represented a new genus. Therefore one specimen was sent to Dr. Catherine S. McFadden (Harvey Mudd College, Claremont, USA) for molecular study using the *msh1* gene. She

confirmed we were dealing with a new genus, but found it to be of uncertain affinity in the phylogenetic tree of octocorallia; “the Chilean species is on its own long branch, not closely related to anything else in the tree” (pers. comm.). Tentatively we place the new genus in the family Clavulariidae because the specimens form stolons and membranes (Figs. 1–2). In this family the new genus most closely resembles *Cryptophyton* Williams, 2000. But in that genus the sclerites are rods and irregular forms, quite unlike the capstans and oval bodies present in *Incrustatus* **n. gen.**

Material and methods

The material is deposited in the Museo de Zoología de la Universidad de Concepción, Chile (MZUC-UCCC); National Museum of Natural History, formerly Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands (RMNH); National Museum of Natural History, formerly United States National Museum, Smithsonian Institution, Washington, D.C., U.S.A. (USNM); and the Zoologische Staatssammlung München, Germany (ZSM). In the material collection data, VH stands for V. Häussermann, GF for G. Försterra.

Class Anthozoa Ehrenberg, 1831

Subclass Octocorallia Haeckel, 1866

Order Alcyonacea Lamouroux, 1812

Family Clavulariidae Hickson, 1894

***Incrustatus*, new genus**

Diagnosis

Colonies form encrusting sheets or the polyps are connected to each other by stolons. Sclerites are radiates and derivatives of these; sculpture of outer surface sometimes rounded and smoother than that of inner surface. Polyps are retractile, weakly armed with only a few rods or all together without sclerites. When preserved, colonies are white with colorless sclerites.

Type species

Incrustatus comauensis **n. sp.**, by original designation and monotypy.

Etymology

The generic name is from the Latin *incrusto*, encrusting, referring to the encrusting nature of the colonies. Gender masculine.

***Incrustatus comauensis* n. sp.**

(Figs. 1–5)

Holotype: RMNH Coel. 33864, colony on *Crepidula*, Chile, Comau Fjord, steep wall north of Punta Llonco, 42°19.894' S, 72°27.661' W (Fig. 5b: 5), depth 8.5 m, coll. VH & GF, 25 December 2004.

Paratypes: MZUC-UCCC 31589, colony on gorgonian, Chile, Isla Laitec (SW of Chiloé Island), Piedra Lile, 43°10' S, 73°37' W (Fig. 5a: S3), depth 13–20 m, coll. VH, 4 March 2005; MZUC-UCCC 31590, colony on *Crepidula*, Chile, Comau Fjord, steep wall north of Punta Llonco, 42°19.894' S, 72°27.661' W (Fig. 5b: 5), depth 3 m, coll. VH & GF, 25 December 2004; MZUC-UCCC 31591, unattached fragments, Chile, Comau Fjord, western shore of Isla Lilihuapi, 42°09.722' S, 72°35.915' W (Fig. 5b: 12), steep wall, depth 5 m, coll. GF, 12 January 2005; MZUC-UCCC 31592, colony on *Crepidula*, Chile, western shore of Comau Fjord opposite of Huinay Station, 42°23.276' S, 72°27.657' W (Fig. 5b: 3), depth 20 m, coll. VH & GF, 20 December 2004; MZUC-UCCC 31593, unattached fragments, Chile, Bernardo Area, Canal Caldcleugh N, 48°24'46.4" S, 74°18'23.6" W (Fig. 5c: C3), depth 6 m, coll. VH & GF, 29 March 2005; MZUC-UCCC 31594, colonies on polychaete tubes, Chile, Comau Fjord, steep wall north of Punta Llonco, 42°19.894' S, 72°27.661' W (Fig. 5b: 5), depth 5.7 m, coll. VH & GF, 25 December 2004; MZUC-UCCC 31595, fragment, Chile, Comau Fjord, steep wall behind Punta Huinay, 42°21.843' S, 72°26.297' W (Fig. 5b: 13), depth 15 m, coll. VH & GF, 4 May 2005; RMNH Coel. 33865, colony on mytilid shell, Chile, Comau Fjord, Punta Huinay, 42°22.483' S, 72°25.693' W (Fig. 5b: 7), depth 7.5 m, coll. VH & GF, 25 December 2004; RMNH Coel. 33866, colony on polychaete tubes, Chile, Muelle (dock) Melinka (Guaitecas Islands), 43°53' S, 73°45' W (Fig. 5a: S4), depth 20 m, coll. VH & GF, 6 March 2005; RMNH Coel. 33867, colony on polychaete tubes, one microscope slide, Chile, western shore of Comau Fjord opposite of Huinay Station, 42°23.276' S, 72°27.657' W (Fig. 5b: 3), depth 14 m, coll. VH & GF, 21 December 2004; RMNH Coel. 33868, colony on gorgonian axis, two microscope slides, Chile, Bernardo Fjord, Isla Caldcleugh S, 48°26'45" S, 74°09'41" W (Fig. 5c: B2), depth 15 m, coll. VH & GF, 28 March 2005; RMNH Coel. 33869, colony on *Crepidula*, depth 13 m, and one on gorgonian axis, depth 15 m, one microscope slide, Chile, Seno de Reloncaví, Lenca, Punta Chaica, 41°38.303' S, 72°40.116' W (Fig. 5a: S2), coll. VH & GF, 24 January 2000; RMNH Coel. 33870, several colonies on rock fragments, together with another clavulariid, Chile, western shore of Comau Fjord opposite of Huinay Station, 42°23.276' S, 72°27.657' W (Fig. 5b: 3), depth 18 m, coll. VH & GF, 21 December 2004; RMNH Coel. 33871, colony on gorgonian axis, Chile, Bernardo Area, Estero Farquhar, 48°29'18.7" S, 74°12'25.7" W (Fig. 5c: B3), depth 14 m, coll. VH & GF, 29 March 2005; RMNH Coel. 33872, colony on *Crepidula*, Chile, Comau Fjord, wall north of Punta Llonco, 42°19.894' S, 72°27.661' W (Fig. 5b: 5), depth 14.5 m, coll. VH & GF, 25 December 2004; RMNH Coel. 33873, unattached fragments, Chile, Dichato, on rocky ledge north of Pingueral, Bahía de

Coliumo, 36°31' S, 72°56' W (Fig. 5a: S1), depth 10 m, coll. VH, 13 December 2005; USNM 1084290, colony on gorgonian, together with another clavulariid, Chile, entrance Quintupeu Fjord, 42°28.215' S, 72°28.214' W (Fig. 5b: 10), depth 15–25 m, coll. M. Schrödl, 25 February 2005; USNM 1084291, colony on *Crepidula*, Chile, western shore of Comau Fjord opposite of Huinay Station, 42°23.276' S, 72°27.657' W (Fig. 5b: 3), depth 20 m, coll. VH & GF, 20 December 2004; USNM 1084292, colony on polychaete tube, Chile, Comau Fjord, wall north of Punta Llonco, 42°19.894' S, 72°27.661' W (Fig. 5b: 5), coll. VH & GF, depth 12.7 m, 25 December 2004; USNM 1084293, unattached fragments, Chile, Comau Fjord, western shore of Isla Lilihuapi, 42°09.722' S, 72°35.915' W (Fig. 5b: 12), steep wall, depth 5 m, coll. GF, 12 January 2005; USNM 1084294, unattached fragments, Chile, Comau Fjord, western shore of Isla Lilihuapi, 42°09.722' S, 72°35.915' W (Fig. 5b: 12), steep wall, depth 5 m, coll. GF, 12 January 2005; USNM 1084295, colony on polychaete tubes, Chile, Comau Fjord, steep wall behind Punta Huinay, 42°21.843' S, 72°26.297' W (Fig. 5b: 13), depth 28 m, coll. VH & GF, 4 May 2005; USNM 1084296, colony on polychaete tube on scleractinian *Desmophyllum dianthus*, Chile, Guaitecas Islands, Melinka, Canal Betecoi, 43°56' S, 73°52' W (Fig. 5a: S4), depth 25 m, coll. VH & GF, 8 March 2005; ZSM 20060119, colony on mytilid, Chile, Bernardo Fjord, 12 km, S shore, 48°29'37.4" S, 74°05'2" W (Fig. 5c: B1), depth 8 m, coll. VH & GF, 27 March 2005; ZSM 20060120, several colonies on polychaete tubes, Chile, Guaitecas Islands, Melinka, Canal Betecoi, 43°56' S, 73°52' W (Fig. 5a: S4), depth 20–30 m, coll. VH & GF, 8 March 2005; ZSM 20060121, unattached colony, Chile, Comau Fjord, Isla Lilihuapi West, 42°09.722' S, 72°35.915' W (Fig. 5b: 12), steep wall, depth 5 m, coll. GF, 12 January 2005; ZSM 20060122, colony on *Crepidula*, Chile, Comau Fjord, Isla Lilihuapi West, 42°09.722' S, 72°35.915' W (Fig. 5b: 12), steep wall, depth 0.6 m, coll. GF, 12 January 2005; ZSM 20060123, colony on wood, Chile, Comau Fjord, steep wall behind Punta Huinay, 42°21.843' S, 72°26.297' W (Fig. 5b: 13), depth 12 m, coll. VH & GF, 4 May 2005; ZSM 20060124, colony on gorgonian, Chile, Bernardo Fjord, Boca Bernardo S (Canal Farquhar), 48°34'40" S, 74°20'18" W (Fig. 5c: B4), depth 20 m, coll. VH & GF, 30 March 2005; ZSM 20060125, colony on gorgonian axis, Chile, Cailín Island (SW of Chiloé Island), 43°09' S, 73°35' W (Fig. 5a: S3), depth 13 m, coll. VH & GF, 26 December 1999; ZSM 20060126, colony on *Crepidula*, Chile, Seno Reloncaví, Lenca, Punta Chaica, 41°38.303' S, 72°40.116' W (Fig. 5a: S2), coll. VH & GF, 14 January 1998; ZSM 20060127, colony on gorgonian axis, Chile, Bahía of Coliumo, Pingueral, 36°31' S, 72°56' W (Fig. 5a: S1), depth 5 m, coll. VH & GF, 6 November 1997; ZSM 20060128, unattached fragments, Chile, Comau Fjord, depth 15–20 m, coll. VH & GF, 2003.

Description

The holotype consists of an encrusting colony partly covering a *Crepidula* shell (Figs. 1a, 2a). The calyces are conical, up to about 1 mm high; a few are hardly projecting above the colony surface. All polyps are retracted.

Sclerites of encrusting part and calyces are similar in shape; eight-radiates and derivatives of these. The smallest are about 0.06 mm long, with complex tubercles (Fig. 3a). Larger radiates have bigger complex tubercles (Fig. 3b–c), and the largest, which are up to 0.12 mm long, become oval bodies with complex tubercles (Fig. 3d). A few of the sclerites have the sculpture of the outer surface rounded and smoother than that of the inner surface (Fig. 3e). Quite a few polyps have a few small spindles, up to 0.12 mm long, with simple tubercles (Fig. 3f). These spindles are irregularly arranged in the polyps and several polyps even seem to lack them completely.

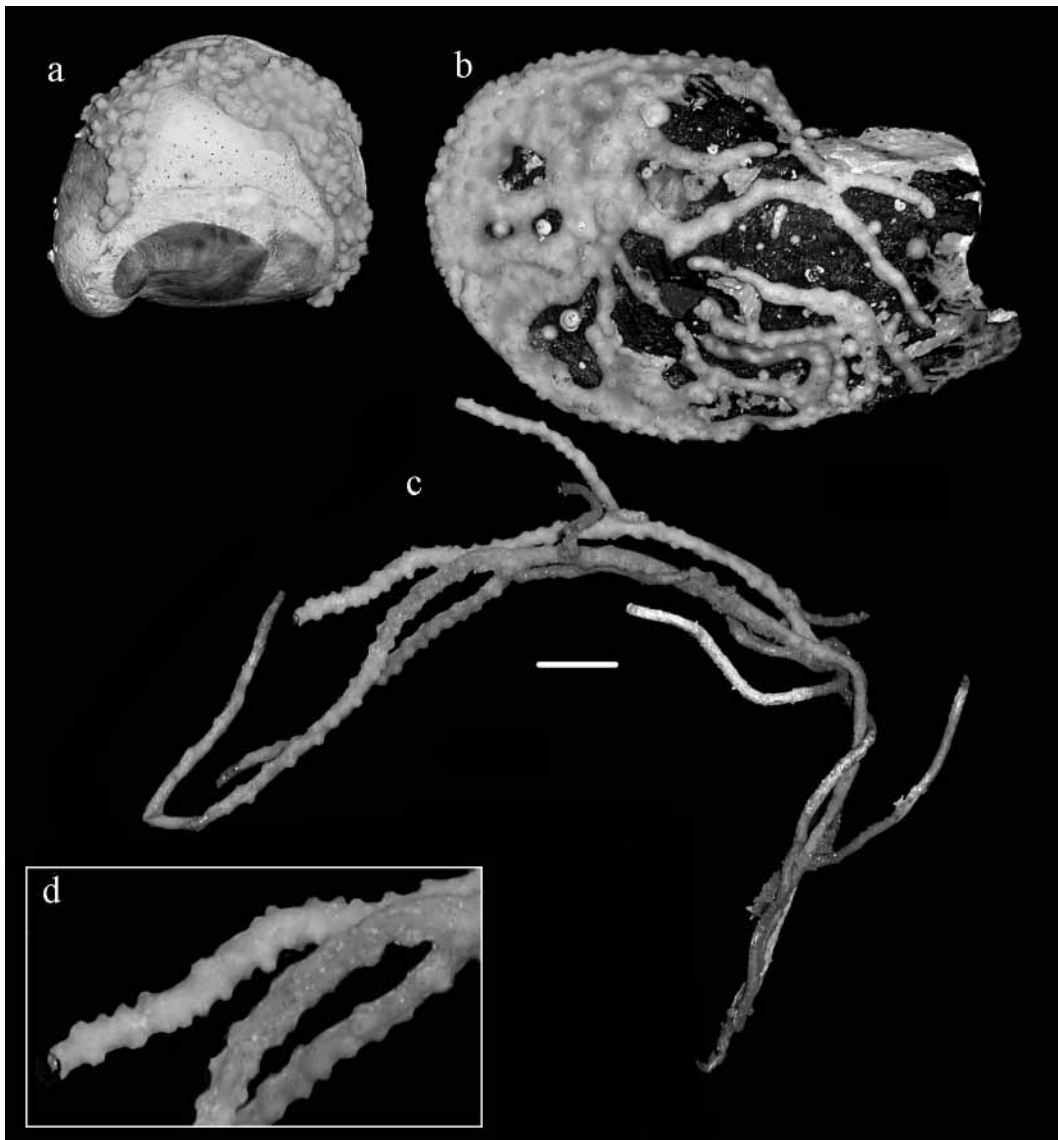


FIGURE 1. *Incrustatus comauensis* n. gen., n. sp.: a, holotype RMNH Coel. 33864; b, paratype RMNH Coel. 33865; c, paratype RMNH Coel. 33866; d, detail of c. Scale 1 cm, applies to a–c.

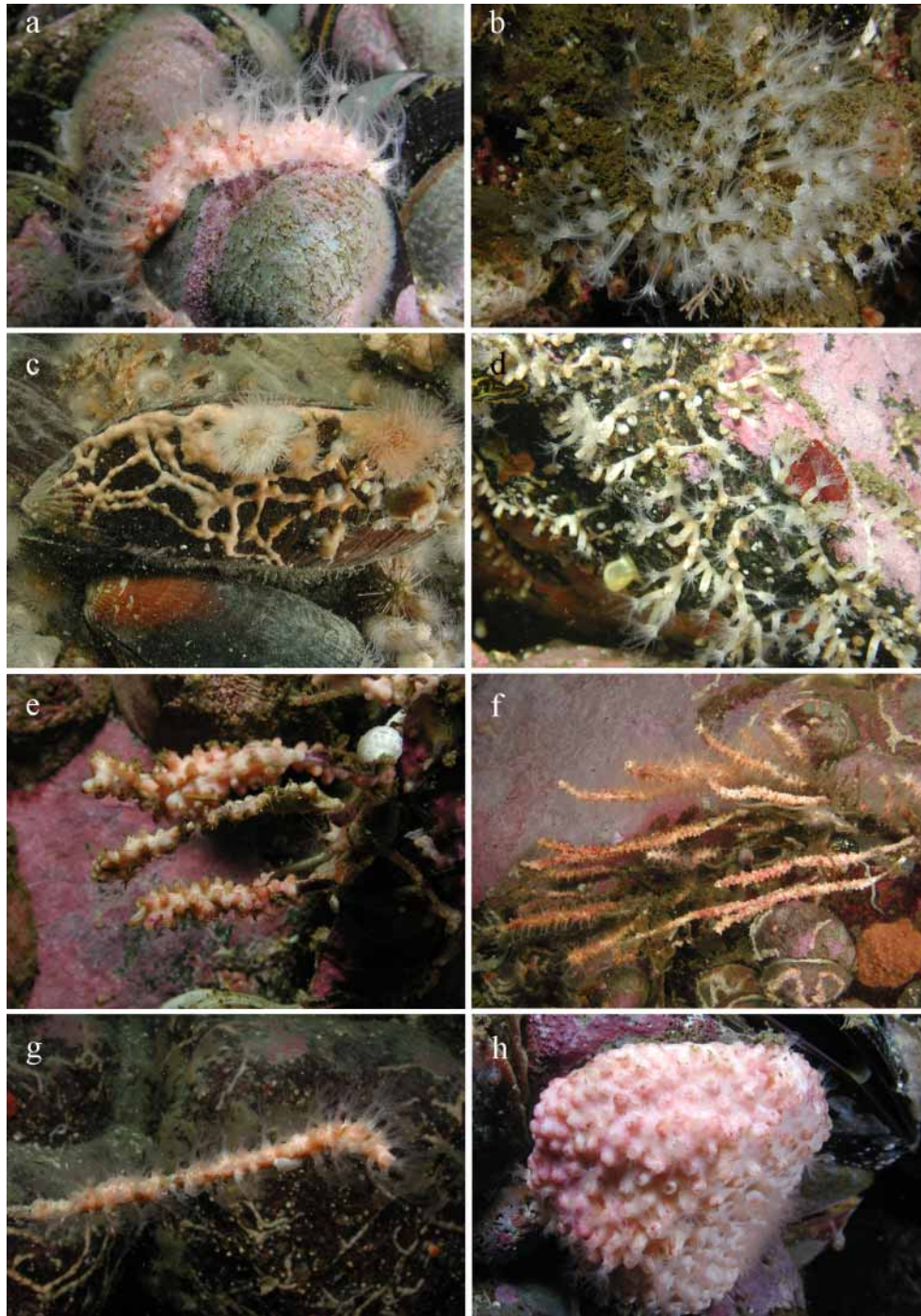


FIGURE 2. Live colonies of *Incrustatus comauensis* n. gen., n. sp.: a, RMNH Coel. 33864, holotype on *Crepidula* shell; b, RMNH Coel. 33872, on *Crepidula* shell; c, ZSM 20060119, on mytilid shell; d, RMNH Coel. 33870, on rock; e, RMNH Coel. 33867, on polychaete tubes; f, MZUC-UCCC 31594, on polychaete tubes; g, RMNH Coel. 33868 (DSCN 2020) on gorgonian axis; h, MZUC-UCCC 31590, on *Crepidula*.

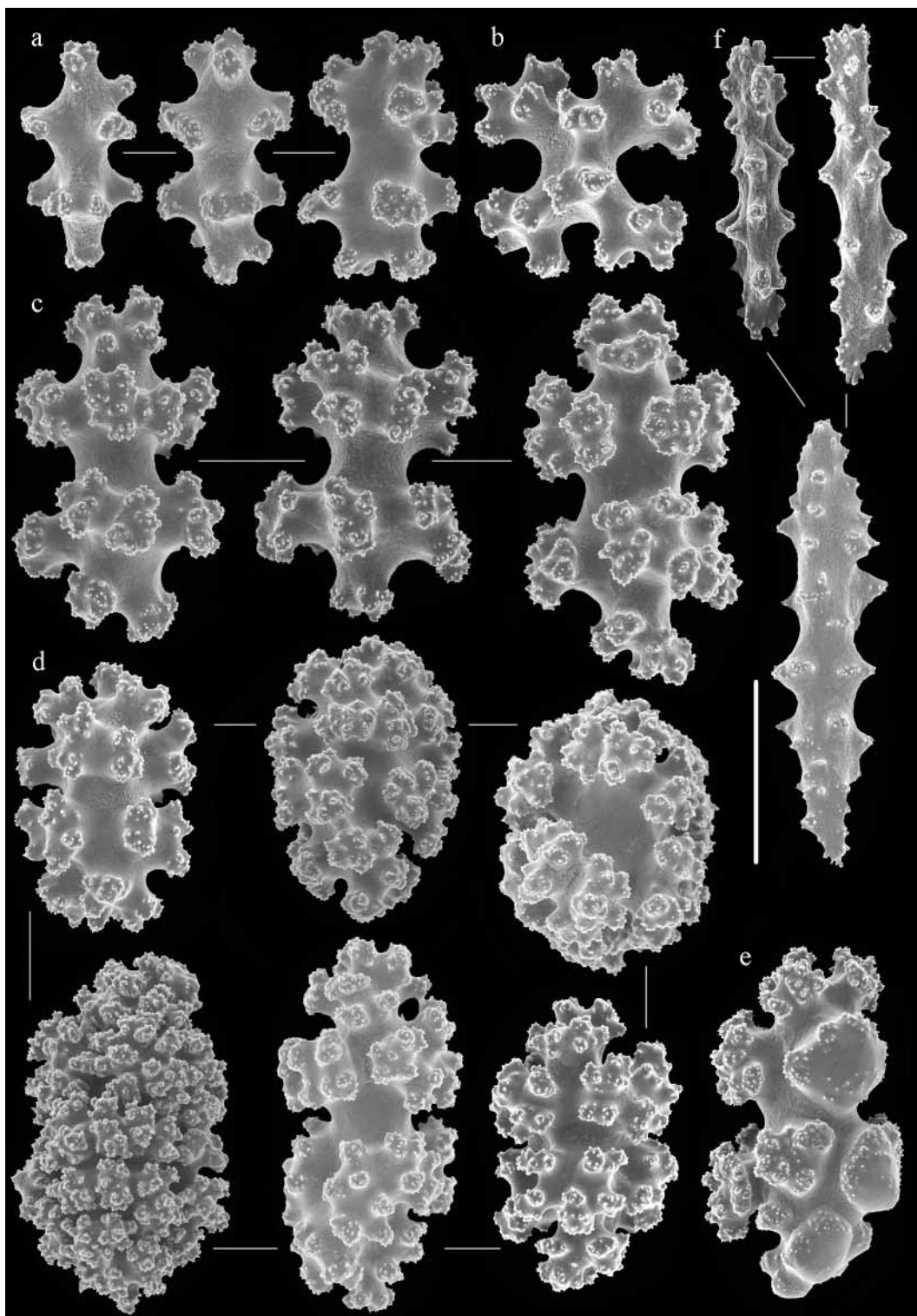


FIGURE 3. *Incrustatus comauensis* n. gen., n. sp., sclerites of holotype RMNH Coel. 33864: b, end view of sclerite; f, from polyps; others from coenenchyme. Scale 0.05 mm.

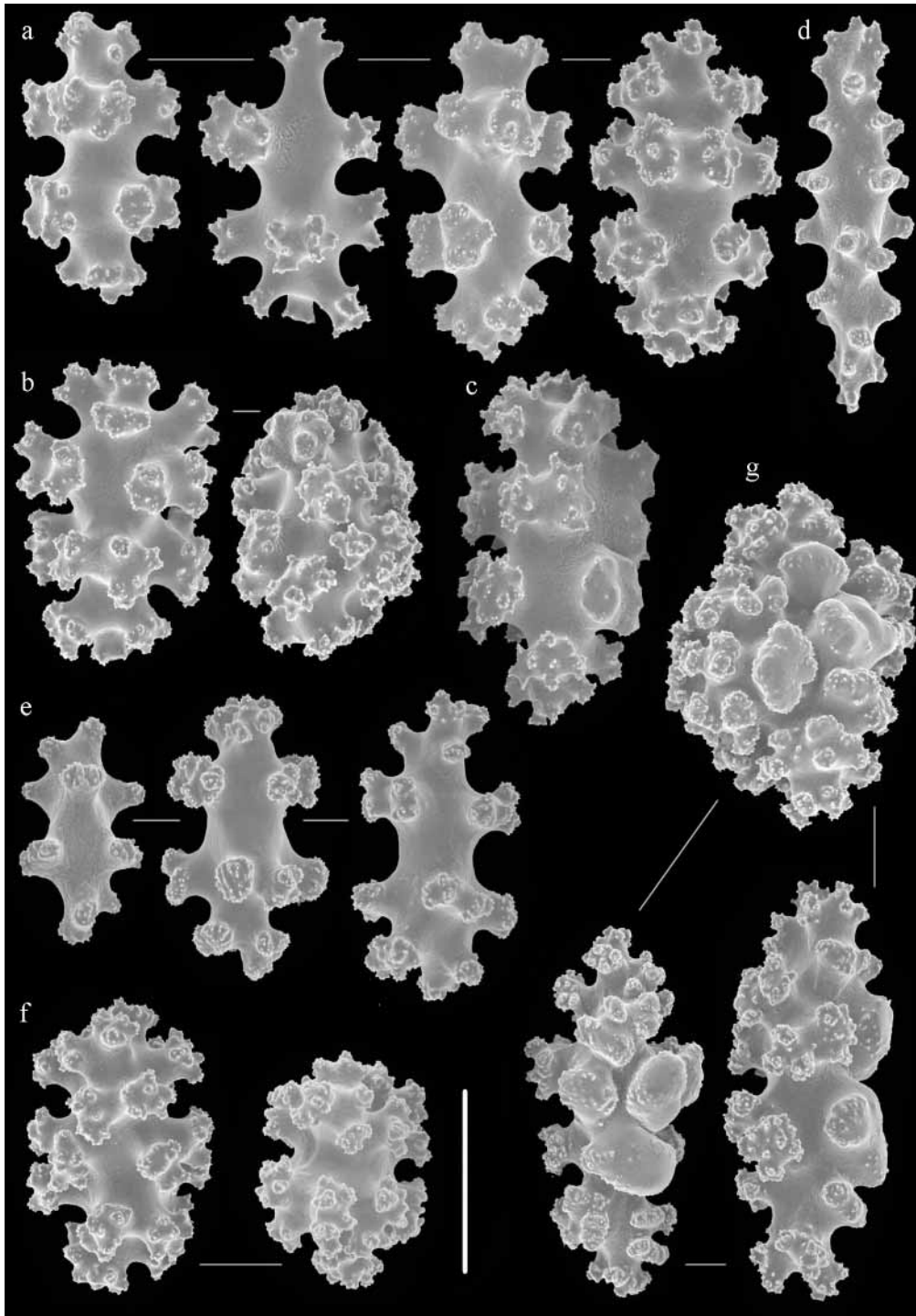


FIGURE 4. *Incrustatus comauensis* n. gen., n. sp.: a–d, sclerites of paratype RMNH Coel. 33865; e–g, sclerites of paratype RMNH Coel. 33866; d, from polyp, others from coenenchyme; a, e, radiates; b, f, ovals; c, g, sclerites with sculpture of the outer surface rounded and smoother. Scale 0.05 mm.

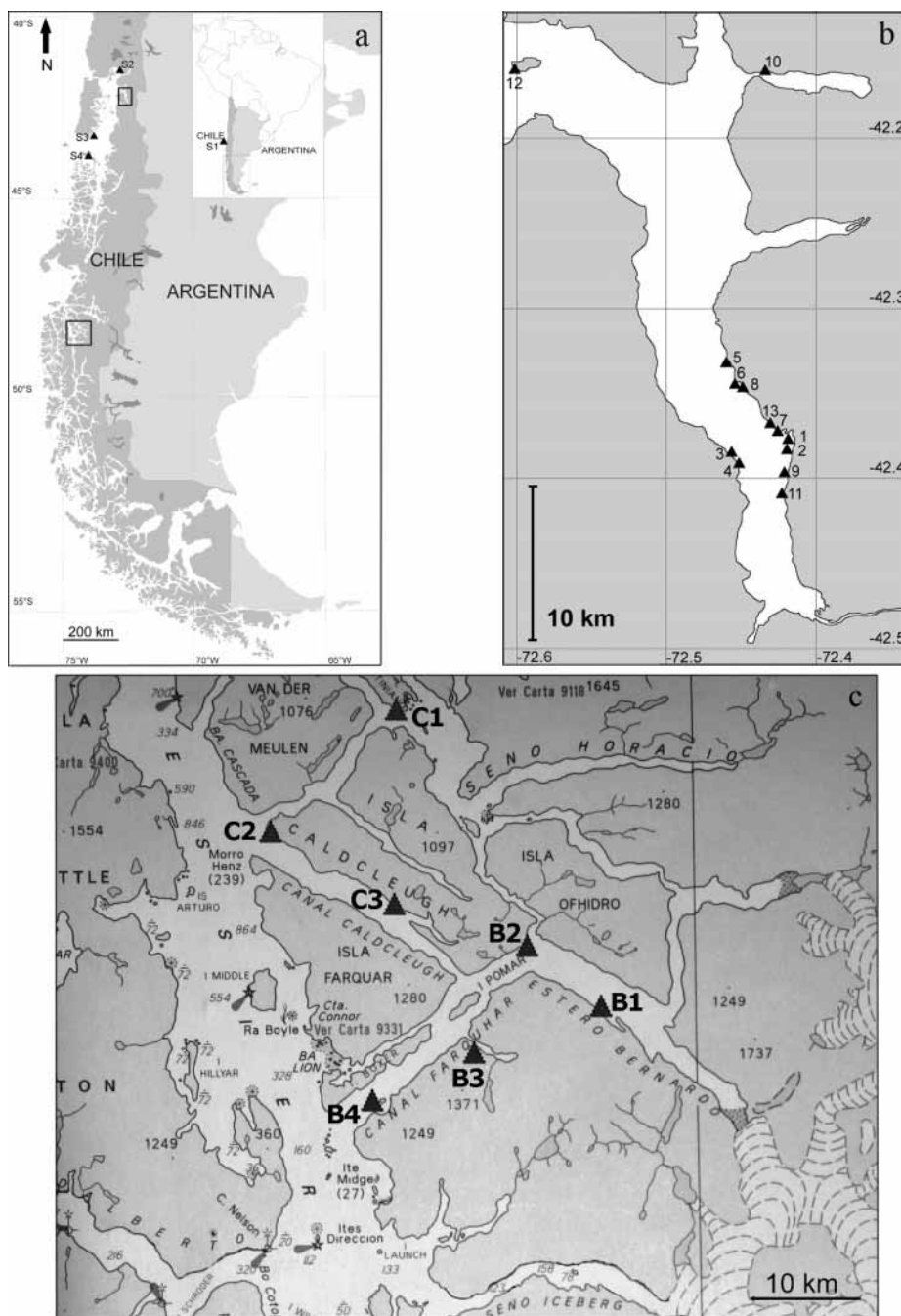


FIGURE 5. *Incrustatus comauensis* n. gen., n. sp., maps showing its distribution: a, southern Chilean fjord region, S1–S4 are additional sites where the studied material was collected, small quadrates indicate areas that are shown in b and c; b, sampling sites in the Comau Fjord with its lateral fjords Cahuelmo (south) and Quintupeu (north) and Lilihuapi Island (12), 5 is the type locality of *Incrustatus comauensis*; c, sampling sites in the Bernardo Fjord (B1–B4) and along the Isla Caldcleugh (C1–C3).

Colour. Preserved colony completely white, sclerites colorless. Alive, the colony was pinkish with white polyps (Fig. 2a).

Etymology

The species is named after the Comau Fjord, the type locality.

Habitat, distribution and abundance

The species can be found from shallow water down to at least 30 m along the exposed coast south of Dichato (approx. 37°S). Within the fjord region it inhabits the channels as well as the inner fjords where it was even sampled in shallow water habitats that are strongly influenced by a low salinity layer (see material and Fig. 5). It is very abundant in the mouth of the Comaufjord and around Chiloe Island between 3 and 15 m where it can cover important proportions of rock and secondary hard substratum. In the region south of the Peninsula Taitao it was only found in the Bernardo fjord area, but not in the Tempano (Iceberg) Fjord that is strongly influenced by glacial sediment. *Incrustatus comauensis* represents one more species with a continuous distribution crossing the traditionally assumed zoogeographical limit between the Peruvian and Magellanic Provinces at approximately 42°S (Brattström & Johanssen, 1983; Häussermann & Försterra, 2005).

Variability

When alive, the color of the colonies can vary to some degree. They can be pinkish (Fig. 2a, f–h), completely white (Fig. 2d), faintly orange (Fig. 2c), or whitish with pink calyces (Fig. 2e). The polyps always seem to be white.

Some colonies clearly form stolons (Fig. 1b, 2c–d), others cover the substrate completely (Fig. 1a, c, 2a–b, e–h). Several types of substrate were found: *Crepidula* and mytilid shells, polychaete tubes, the axis of gorgonians (*Primnoella* sp.), or the colonies were simply overgrowing rocks.

The length of the calyces also varies to some extent, from hardly protruding above the coenenchyme to several mm long.

Finally, the sclerites do vary somewhat; for comparison the sclerites of specimens growing on a mytilid shell (Fig. 4a–c) and polychaete tubes (Fig. 4e–g) are also presented. Notably, the specimens growing on gorgonian axes or polychaete tubes have more sclerites with sculpture of the outer surface rounded and smoother than that of the inner surface (Fig. 4g). Several specimens have hardly any polyp spindles.

Remarks

In the family Clavulariidae, *Incrustatus comauensis* most closely resembles *Cryptophyton goddardi* Williams, 2000. But it differs in having sclerites in the form of radiates and derivatives of these; especially, the sclerites with rounded sculpture on the

outer surface, smoother than that of inner surface, are completely absent in *C. goddardi*. This latter sclerite type is found in species of *Paratelesto* Utinomi, 1958, and *Telesto* Lamouroux, 1812, but these taxa have arborescent colony shapes.

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References

- Brattström, H. & Johanssen, A. (1983) Ecological and regional zoogeography of the marine benthic fauna of Chile. Report No. 49 of the Lund University Chile Expedition 1948–49. *Sarsia*, 68, 289–339.
- Ehrenberg, C.G. (1831) *Symbolae physicae, seu icones et descriptiones corporum naturalium novorum . . . Pars Zoologica*, 4. Berlin.
- Häussermann, V. & Försterra, G. (2005) Distribution patterns of Chilean shallow-water sea anemones (Cnidaria: Anthozoa: Actiniaria, Corallimorpharia); with a discussion of the taxonomic and zoogeographic relationships between the actinofauna of the South East Pacific, the South West Atlantic and Antarctica. *In*: Arntz, W.E., Lovrich, G.A. & Thatje, S. (Eds.), *The Magellan-Antarctic connection: links and frontiers at high southern latitudes*. *Scientia Marina*, 69 (Suppl. 2), 91–102.
- Haeckel, E. (1866) *Generelle Morphologie der Organismen*. Berlin, 1036 pp.
- Hickson, S.J. (1894) A revision of the genera of the Alcyonaria Stolonifera, with a description of one new genus and several new species. *Transactions of the Zoological Society of London*, 13 (9), 325–347.
- Lamouroux, J.V.F. (1812) Extrait d'un mémoire sur la classification des polypiers coralligènes non entièrement pierreux. *Nouveau Bulletin des Sciences par la Société Philomatique, Paris*, 3 (63), 181–188.
- Studer, T. (1878) Übersicht der Anthozoa Alcyonaria, welche während der Reise S.M.S. Gazelle um die Erde gesammelt wurden. *Monatsberichte der Königlich preussischen Akademie der Wissenschaften zu Berlin* 1878, 632–688.
- Utinomi, H. (1958) On some octocorals from deep waters of Prov. Tosa. Sikoku. *Publications of the Seto Marine Biological Laboratory*, 7 (1), 89–110.
- Williams, G.C. (2000) A new genus and species of stoloniferous octocoral (Anthozoa: Clavulariidae) from the Pacific coast of North America. *Zoologische Mededelingen Leiden*, 73 (24), 333–343.