

FIRST RECORDS OF OCTOCORALLIA (CNIDARIA: ANTHOZOA) OF THE CAPE HORN BIOSPHERE RESERVE, MAGELLAN REGION, CHILE

PRIMEROS REGISTROS DE OCTOCORALLIA (CNIDARIA: ANTHOZOA) PARA LA RESERVA DE LA BIOSFERA CABO DE HORNO, MAGALLANES, CHILE

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Information about benthic communities of the Magellan region is largely restricted to ecological studies undertaken in the intertidal boulder-cobble fields and subtidal soft bottoms (Guzmán & Ríos 1981, Ríos & Guzmán 1982, Benedetti-Cecchi & Cinelli 1997, Ríos & Gerdes 1997, Cañete *et al.* 1999, Gerdes & Montiel 1999, Ríos & Mutschke 1999, Thatje & Mutschke 1999, Ríos *et al.* 2003, Montiel 2005, Ríos *et al.* 2005). Despite the rocky bottoms in the shallow subtidal of the Magellan region are very common, data regarding of taxonomical composition and spatial - temporal distribution of benthic organisms are almost absent (Försterra *et al.* 2005).

On the other hand, improvement in the taxonomic knowledge of benthic groups poorly understood such as sea anemones (Häussermann 2004, Häussermann & Försterra 2005, Häussermann 2006), hydrocorals (Häussermann & Försterra 2007) and ascidians (Sanamyan & Schories 2003) have been done. In this context, the inventory of the soft coral fauna (Octocorallia) from the Magellan region is based on a few records from the shallow waters (van Ofwegen *et al.* 2006, 2007). Nowadays, few species have been described for Chilean waters; *Clavularia magelhaenica* Studer, 1878, which belongs to the group of stoloniferous, was originally described from the Strait of Magellan and several species belonging to the genus *Alcyonium* such as *Alcyonium antarcticum* Wright & Studer, 1889, *Alcyonium haddoni* Wright & Studer, 1889, *Alcyonium sollasi* Wright & Studer, 1889, *Alcyonium paessleri* May, 1899 (synonymized with *A. antarcticum* by Verseveldt & van Ofwegen 1992) have been recorded. Recently, van Ofwegen *et al.* (2007) recognize eight different species of genus *Alcyonium*, half of them from the Magellan region and four new species found north of the Magellan region. Other soft corals described from Chilean waters include the species *Renilla chilensis* Philippi, 1892, and the recently described clavulariid *Incrustatus comauensis* van Ofwegen *et al.* 2006 (Riveros 1948, Verseveldt 1967, Verseveldt & van Ofwegen 1992, Casas *et al.* 1997, Pérez & Zamponi 1999, van Ofwegen *et al.* 2006).

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The present study reports new records and extend the distribution range of *Alcyonium haddoni* and *Incrustatus comauensis* to the southernmost part of the Magellan region, being the first contribution to the shallow water invertebrate inventory of the Cape Horn Biosphere Reserve.

Murray Channel (55°02'S, 68°09'W) is located in the south part of the Magellan region, south of the Beagle Channel, between Hoste Island and Navarino Island (Fig. 1). It is part of marine buffer zones of the Cape Horn Biosphere Reserve. The narrowest part of the channel has rock walls on both sides. Maximum depths in the narrow section of the channel range between 90 and 120 m, while at the southern part, depths range between 200 and 250 m. In the protected zone of the Murray Channel salinity values are around 31.8 psu and water temperatures are 6 to 7 °C in spring. The channel presents estuarine water produced by the mixing of Subantarctic waters (ASAA) with fresh water, giving a moderated oceanic influence (Avaria *et al.* 2003, Valdenegro & Silva 2003).

In October 2006, samples of *Alcyonium haddoni* and *Incrustatus comauensis* were collected by SCUBA diving in the Murray Channel (55°02'S, 68°09'W), near Puerto Corrientes. Samples were taken between 5 and 30 m depth. Specimens were preserved in 4% formalin-seawater and later transferred to 70% ethanol. The samples of *A. haddoni* and *I. comauensis* were deposited at the National Museum of Natural History, formerly Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands (RMNH). The material was deposited with the codes *A. haddoni* (RMNH Coel. 38431) and *I. comauensis* (RMNH Coel. 31949).

Additional material was collected in 2007 on steep walls at Tilly Bay (53°34'S, 72°23' W), Carlos III Island, Strait of Magellan. The material was deposited at the National Museum of Natural History, Leiden, The Netherlands (RMNH Coel. 38483) and at the "Edmundo Pisano Reference Collection" of the Instituto de la Patagonia, Universidad de Magallanes, Punta Arenas, Chile (UMAG-IP-CNI 600001).

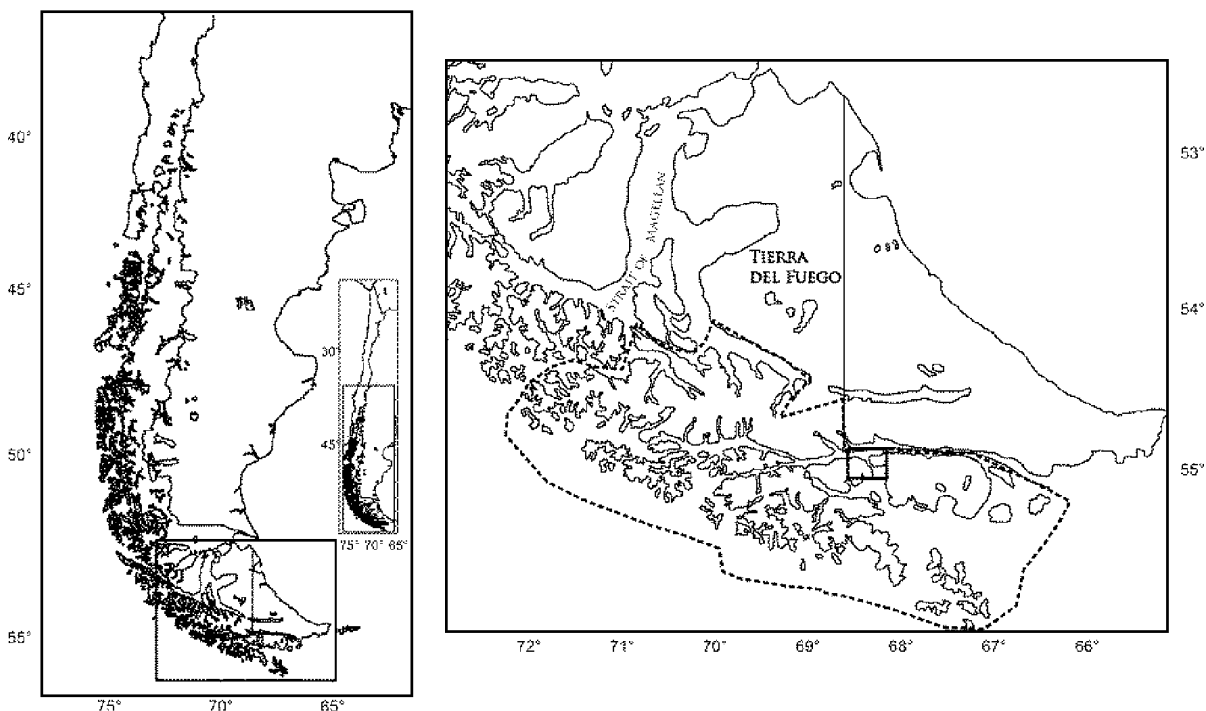


Fig. 1. Map showing the location of Murray Channel, Magellan region, Chile. Segmented line shows the area of the Cape Horn Biosphere Reserve.

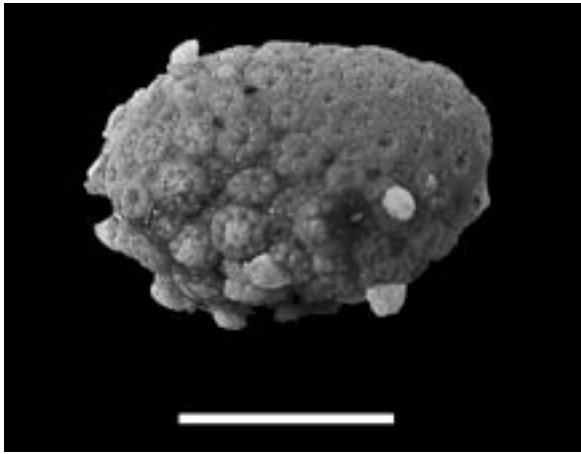


Fig. 2. *Alcyonium haddoni* Wright & Studer, 1889 (RMNH Coel. 38431) collected at the Murray Channel, Chile. Scale: 10 mm.

ACCOUNT OF SPECIES

Class Anthozoa Ehrenberg, 1831

Subclass Octocorallia Haeckel, 1866

Order Alcyonacea Lamouroux, 1812

Family Alcyoniidae Lamouroux, 1812

Genus *Alcyonium* Linné, 1758

Alcyonium haddoni Wright & Studer, 1889

Alcyonium haddoni was found growing at 24 m water depth on a steep rock wall of Murray Channel, north of Puerto Corrientes.

The colony measures 19 mm in height and about 11 mm in width (Fig. 2). Colony consisting of a single, flattened, rounded lobe with dome shaped calyxes. Anthocodiae with a collaret composed of 5-6 rows of spindles; these spindles are up to 0.40 mm long, with simple tubercles (Fig. 3a-c). Points with spindles similar to those of the collaret; distally they become club-like. In the tentacles spiny rods are found, up to 0.20 mm long. The surface layer of the top of the colony has clubs, up to 0.20 mm long, with spiny heads (Fig. 3h-k); the interior has spindles with rather complex tubercles, up to 0.30 mm long (Fig. 3d-g). The surface layer and interior of the base of the colony have sclerites similar to those of the top of the colony, but they are slightly shorter.

Alive and preserved colonies are orange; tentacle rods are colorless, other sclerites yellow.

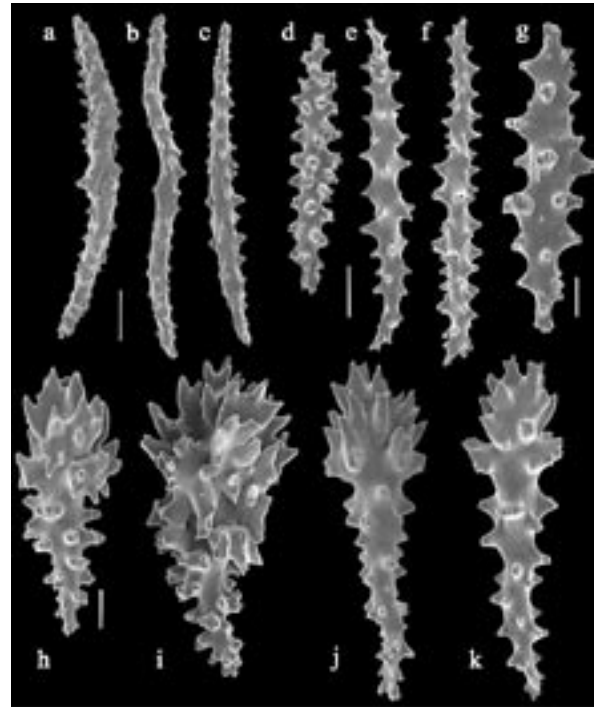


Fig. 3. *Alcyonium haddoni* Wright & Studer, 1889; a-c, anthocodial spindles; d-g, spindles of the interior; h-k, clubs of surface layer. Scales (a-f): 0.05 mm; (g-k) 0.02 mm.

Alcyonium haddoni was originally described from the Messier Channel, Chile, at 315 m depth. It has been found from 5-315 m depth. Despite his poor original description, this species has been recognized twice in Argentina (Verseveldt 1967, Pérez & Zamponi 2004). These identifications were probably wrong, because the material described from Argentina were different in the colony form and clubs. Recently, van Ofwegen *et al.* (2007) redescribed this species based on material collected in shallow waters of the South Chilean fjord region. In Chile this species has been widely found from 43°S to 51°S. According to van Ofwegen *et al.* (2007) this species must be regarded as the most common *Alcyonium* in Chile. This is the southernmost record of this species, extending the geographical distribution range from 43°S to 55°S.

Alcyonium haddoni examined from the Murray channel, has the typical colony form found at the southern fjord region, consisting of a single lobe. The presence of only spindles also characterizes this species.

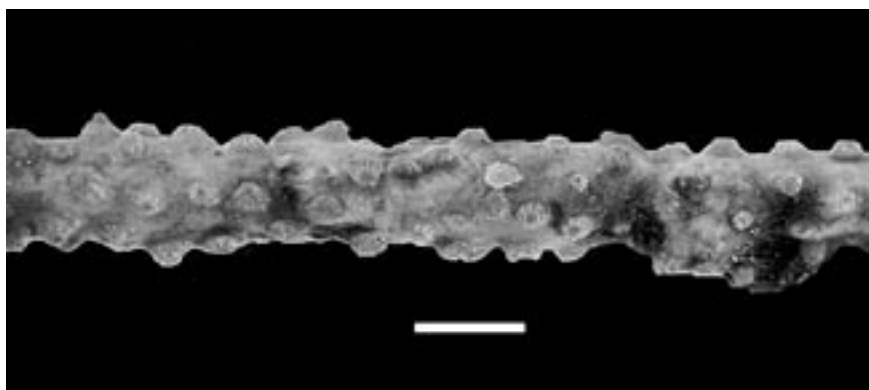


Fig. 4. *Incrustatus comauensis* van Ofwegen *et al.*, 2006 (RMNH Coel. 31949) over a gorgonian, collected at the Murray Channel, Chile. Scale: 5 mm.

Family Clavulariidae Hickson, 1894

Genus *Incrustatus* van Ofwegen *et al.*, 2006

Incrustatus comauensis van Ofwegen *et al.*, 2006

Incrustatus comauensis was found from 5 to 30 m depth on vertical rock walls growing over the axis of the gorgonian *Primnoella chilensis*, tubes of the polychaete *Chaetopterus variopedatus* and covering rocks walls (Fig. 5a,b).

The material analyzed consists of a colony covering the axis of *Primnoella chilensis* (Fig. 4). Sclerites are more complex with increasing size. Smallest sclerites have complex tubercles. Largest are oval bodies with complex tubercles. Some polyps have a few small spindles, irregularly arranged in the polyps, with simple tubercles.

Alive colonies are pink with white polyps (Fig. 5a). Preserved colonies are white.

Colonies were more frequently found down to 20 m where the density of the population was about 22 colonies per m². Population densities were higher at this depth due higher availability of secondary substratum, especially gorgonians, *Chaetopterus* tubes and overhanging surfaces. Smaller densities were found from 5 to 15 m with 4-6 colonies per m².

Incrustatus comauensis has been reported along the south Chilean coast from Dichato (37°S) to Farquhar Channel (48°S). It was recently described by van Ofwegen *et al.* (2006) from shallow waters of the fjord region of southern Chile, living over different substrates forming stolons over mytilids and rocks or forming encrusting sheets on gastropods, gorgonians and polychaete tubes. This report



Fig. 5. *Incrustatus comauensis* van Ofwegen *et al.*, 2006; a, (white arrow) growing over the gorgonian *Primnoella chilensis*; b, (white arrow) over tubes of the polychaete *Chaetopterus variopedatus*.

constitutes the southernmost record of this species, extending the geographical distribution range from 37°S to 55°S.

The material collected were principally colonies forming sheets over polychaetes tubes and other gorgonians and forming stolons over rock walls. This colony forms differs from others species of Octocorallia present in the region.

During recent years comprehensive investigations have been performed to extend the restricted knowledge about the marine life and environmental conditions of the Magellan Region. Nevertheless, knowledge about macrobenthic communities in this area is still limited and, therefore, data from this area are of considerable scientific interest (Thatje & Mutschke 1999).

The shallow water steep wall habitats, which are an important portion of the substratum in the channels and fjords, has been sampled only during recent years (Häussermann & Försterra 2007). Arrival of modern SCUBA diving equipment and photographic techniques have allowed sampling in such habitats, which were not accessible by conventional collecting gear such as nets, dredges or grabs (Häussermann 2004, Schrödl *et al.* 2005). As a matter of fact, *A. haddoni* is one of the most common *Alcyonium* species along the Chilean coast, however, it has not been collected south of the Strait of Magellan until now.

Alcyonium haddoni can be mistaken as there are other species in the region with similar colony form. Thus analyze of SEM images of the sclerites are needed to make a correct identification of the material. The single colony of *A. haddoni* found at the Murray channel, had the typical colony form found at the Northern and Central Patagonian zone (43°S - 51°S), consisting of a single lobe. Sclerites analyzed fits with description of the material described by van Ofwegen *et al.* (2007), in terms of morphology and size of sclerites and presence of tuberculated internal spindles.

Incrustatus comauensis was found forming stolons over rock walls and covering tubes of polychaetes and gorgonian axis. This species was placed by van Ofwegen *et al.* (2006) as Clavulariidae because colonies form encrusting sheets or stolons. *I. comauensis* differs from all other species present in the region, based on colony form and presence of radiates sclerites, becoming oval bodies with complex

tubercles. Colonies are very abundant at the study site, especially down to 20 m, where there is more secondary substrate available.

Incrustatus comauensis represent species with a continuous distribution crossing the traditionally assumed zoogeographical limit of the Magellan region, thus failed to support the classical hypothesis of a general faunal break at approximately 42°S (Brattström & Johanssen 1983, Camus 2001, Häussermann & Försterra 2005, Häussermann & Försterra 2007). This situation has been described for other groups such as sea anemones and polychaetes, showing a gradual replacement of warm water species through cold water species along the Chilean coast (Montiel 2005, Montiel *et al.* 2005, Häussermann 2006). In the future, more research is needed in order to clarify whether the faunal break at the Peninsula Taitao exists as has been postulated over the years.

Our recent findings are examples of the poor state of knowledge about benthic communities of rocky bottoms at the Magellan region. Intensification of SCUBA diving sampling will likely add further distribution extensions and more species records in the area.

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