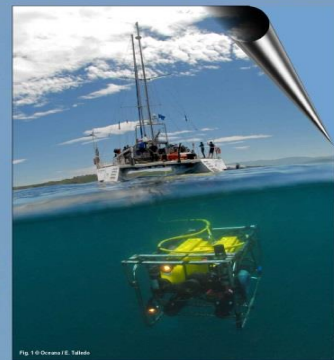




Redescription and ecological characterisation of *Artemisia transiens* Topsent, 1890 collected by ROV techniques 120 years after original description

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INTRODUCTION

In July 2008, Oceana Europe organized a cruise in Galicia and Cantabrian waters with the aim of to investigate about ecological significant areas to the amplification on marine protected spaces network. This expedition on board the "Oceana Ranger", a Ketch catamaran of 23.5 metres long, carried out 51 dives with a ROV (*Remote Operated Vehicle*) (Fig. 1) counted more than 88 effective filmed hours. The ROV employed was a Phantom HD 2+2 of Deep Ocean Engineering providing a digital camera of 750 resolution lines. In ten different places in Galicia and Asturias was registered a sponge with a characteristic habitus named in the expedition "mushroom sponge". This species was found at different depths (sometimes in high densities) but preferably more than 50 m. To identify and study it, a special dive with ROV and divers were prepared to collect samples and analyze the specimens. As result of these dives, 10 specimens were collected in the Somos Llungo area in the west of Peñas Cape (Asturias) at 48-50 m deep. The specimens belong to *Artemisia transiens* Topsent 1890 species, a globular pedunculate sponge with apical oscules and even surface. The species is known only from the North West coast of Spain, and its status was questionable. In fact, there are only two records of this species after original descriptions.

MATERIAL AND METHODS

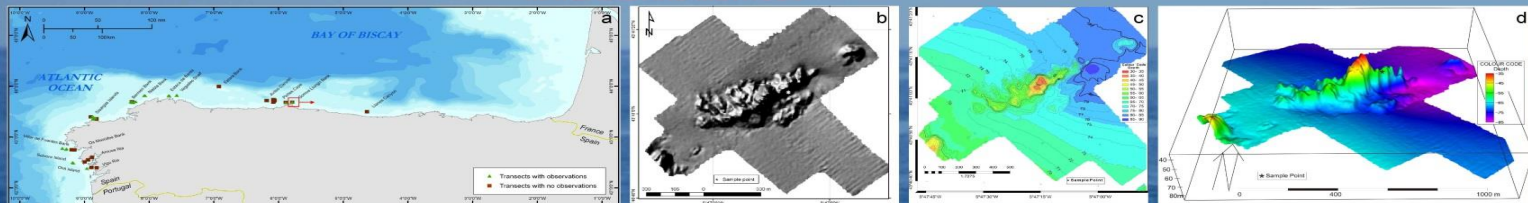


Fig. 2. a. Study area showing the dives of ROV in Galician and Cantabrian coast. b. Digital terrain model (DTM) showing the area mapped during the cruise Aviles-0410. c. Coloured (swath bathymetry) shaded relief map of the Somos Llungo area. Isobaths every 1m. d. Three-dimensional (3D) image of the ROV Somos Llungo area. Point of view from the south.

A total of 51 ROV's dives between -9 m and -260 m depth, and 54 dives by divers between 0 and -35 m were made. ROV transects lasted from 1 to 4 hours depending on the site. It surveyed distances between 0.3 and 1.2 nm. The ROV sailed at 0.2-0.4 knots positioned a few centimeters above the seafloor with the camera slightly tilted downward to have a vision aisle of 1.5-2 m wide and a depth image of 4-5 m. Area surveyed per hour was of approx. 700-850 square meters (Fig. 1). 10.2 megapixels Reflex photographic cameras and High Definition HDV video cameras were used by divers, while ROV Phantom HD2+2, was equipped with a 750 resolution line camera with F1.2 lens and 1:12 zoom. Sponge samples were taken by divers at 50 meters in position 43°41.085'N 05°47.177'W, after localization by ROV. 88h09m of ROV and 18h21m of divers' filmed materials were collected, as well as some 4,000 photos. The area covered was approx. 70,500 square meters of seafloor. 21 out of 51 ROV's dives and 34 of the 51 ROV's dives were carried out from the Eastern south Gulf of Biscay (Cantabrian Sea) to the Galician coast were A. transiens findings concentrated, collecting 57h06m of ROV and 5h07m of filmed materials and approx. 1,500 photographs. Only those 34 ROV's transects are the ones that are being taken into account in the following analysis, adding up to 57h06m of film footage and approx. 45,480 m² covered. No one diver dive found A. transiens while 19 ROV's transects in 11 different locations did find the species between -35 and -126 meters depth. The morphology of the seafloor of the Somos Llungo area was obtained during one cruise onboard R/V Vizconde de Eza in 2010 in the framework of the study of Vulnerable Marine Ecosystems on the INDEMARES Project. Navigation was provided by a differential GPS system integrated with the ship central navigation system. Swath bathymetry data were acquired using a multibeam echosounder Simrad EM-300, which works with a transmission frequency of between 26 and 34 kHz, swath opening of up to 135° and 135 beams per ping. In addition to echosounding information we also recorded in digital form, the backscattered reflectivity of the sea floor imaged by their multibeam transducers. Data were logged and processed with SIS, Neptune and C-Floor software packages, obtaining a grid resolution of 5 m with full seafloor coverage meeting the International Hydrographic Organization standards for marine hydrographical surveys. Analyses and representation of bathymetric data were performed with ArcGIS software.

DESCRIPTION

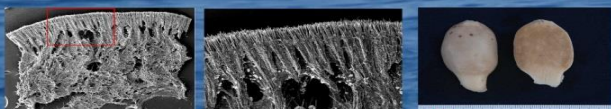
Phylum Porifera Grant, 1836
 Class Demospongiae Sollas, 1885
 Order Poecilosclerida Topsent, 1928
 Suborder Microcionina Hajdu, van Soest & Hooper, 1994
 Family Microcionidae Carter, 1875
 Subfamily Ophlitaspongiinae de Laubenfels, 1936
 Genus *Artemisia* Vosmaer, 1885
Artemisia transiens Topsent, 1890



Habitus: Globular pedunculate sponge with several apical oscules slightly raised. Mushroom appearance. The surface is even but finely hispid, it reminds surface of Suberitidae species. Consistence firm; Color: surface white, beige or whitish cream; Coanosome brownish and beige in the peduncle area. Size: up to 6 cm high x 5.5 cm in diameter.



Skeleton: Bigger styles are in a confused disposition in the coanosome and they are arranged in bouquets near the ectosome where the small styles are perpendicular to the surface in a dense palisade. The points of styles protrude in the surface in a fine hispidation.



Spicules: Styles in two size categories, palmate isochelae, toxas.
Megascleres: The ectosomal styles are smaller but not clearly differentiated in size from those of the coanosome, they are provided with microspined heads, 150-250 µm; coanosomal styles likewise provided with microspined heads: up to 600 µm in length.
Microscleres: Palmate isochelae: 20 µm; toxas thin, shallowly curved, with smooth apices: up to 100 µm long.



ECOLOGICAL CHARACTERIZATION

Artemisia transiens have been found always on rocky beds from -35 to -126 meters depth. It seems to prefer big, sloped rocks with low turbidity and low sedimentation between -50 and -90 m, but it also occurs on small and flat rocks partially or fully covered by sediments down to -126 m. Although it can be fixed on rocks with different slopes' grades and orientation, including vertical walls, over overhangs, at the entrance of caves, slabs, etc., this sponge is more abundant in areas typically occupied by suspensivorous species like gorgonians. The density of these communities can reach up to 50-60 ind/m², looking like "mushroom fields". A characteristic of its morphology is that those specimens on areas with high grade of sedimentation or where it has to compete with other fauna, the shape of the sponge gets more elongated and the stalk grows taller. Typical community where this species occurs is dominated by demospongiae. Most common species found with it are those of its own order Poecilosclerida (e.g. *Desmacion fruticosum*, *Tedania urgorini*, *Guliana solarzani*, *Clathra atrasanguinea*, *Antho dichotoma*, etc.) and those of the order Axinellida (*Phakellia* spp. and *Axinella* spp. or *Adreus fascicularis*). In many places it occupies a transitional zone between the deep sea coral (*Dendrophyllia cornigera*) forests and the cup sponge (*Phakellia ventrilarum*) fields. Cnidarians are also common, sometimes sharing substrate with dense communities of *Corynactis viridis* or hydrozoans, and some others with scattered gorgonians. Brachiopods are also highly abundant on rocks occupied by A. transiens, but they chose two different niches, while brachiopods have big colonies in the lower part of the rocks, the sponge prefers the upper zone.

