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ORIGINAL ARTICLE

Rediscovery of *Cereopsis studeri* Koch, 1891, a forgotten Mediterranean soft coral species, and its inclusion in the genus *Nidalia* Gray, 1835 (Octocorallia, Alcyonacea, Nidaliidae)

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Abstract

Cereopsis studeri was described by G. von Koch in 1891 with material from Naples. However, it was subsequently synonymized, erroneously identified, and overlooked in subsequent soft coral literature of the twentieth century. After the original description, this species was not recorded or correctly described for 120 years. The study of newly collected material from the North Western Mediterranean permits the re-description of this forgotten species and its assignation to the genus *Nidalia* in the family Nidaliidae. The main features of *Nidalia studeri* com. nov. are: colony torch-like, a capitulum light orange in colour, not laterally flattened, dome-shaped and not distinctly projecting beyond the stalk, introvert with sclerites transversally placed in two longitudinal rows per interseptal space, anthocodial crown with 28–38 sclerite rows, points separated from polyps distally, formed by 6–9 pairs of sclerites, and the presence of intermediate points (secondary points) between principal (interseptal) ones. *Nidalia studeri* is here compared with its closest congeners, especially with the Indonesian species *N. simpsoni*, species from the West Indian Region *N. dissidens*, *N.occidentalis*, *N. deichmannae*, and the recently described *Nidalia aurantia* from the Mid-Atlantic Ocean. This is the first time that the genus *Nidalia* and the family Nidaliidae have been reported with certainty for the Mediterranean Sea.

Key words: *Mediterranean, Alcyonacea, manned submersible,* Cereopsis studeri, Nidalia, *soft coral*

Introduction

Mediterranean fauna has often been reported as one of the best known faunas in the world (Bianchi & Morri 2000). Important revisionary works on different taxonomically complex invertebrate groups give that impression (e.g. Ruffo 1982–1998 for amphipods; Weinberg 1976, 1977 and 1978 for gorgonians, soft corals and stolonate octocorals; Carpine & Grasshoff 1975 for gorgonian octocorals; Zibrowius 1980 for scleractinian corals; Bouillon et al. 2004 for hydrozoans; Zabala & Maluquer 1988 for bryozoans). However, there are still numerous cryptic species waiting to be discovered, and relict or remote ecosystems still poorly sampled. An example of the first case is the recently described small gorgonian *Dendrobrachia bonsai* López-González & Cunha, 2010, with a relatively wide distribution from the Gulf of Cadiz to the Corsican Strait. An example of the second case is the rich jellyfish fauna, including many endemic species, found in North Western submarine canyons (Gili et al. 1998).

Cereopsis studeri was described by Koch (1891) from the Gulf of Naples, Italy. This species was simply assigned to the genus *Nidalia* Gray, 1835 by May (1900: 101), without additional comments or discussion. This latter author considered the genus *Cereopsis* Kent, 1870 as a junior synonym of *Nidalia*. Later, Pütter (1900: 447) considered *C. studeri* in the genus *Bellonella* Gray, 1862, Kükenthal (1907: 384) assigned Koch's species to the genus *Gersemia* Marenzeller, 1878, and Thomson & Dean (1931: 44) supposedly identified this species among the material collected during the Siboga Expedition to East Indies, although the sampling station was not recorded and the description is too vague for a

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specific identification. More recently, Stiasny (1941: 17–20, Figures 8–10) ascribed to this species a colony clearly different to that described by Koch. It is more attributable to a colony of *Paralcyonium* Milne Edwards & Haime, 1850 with partially retracted polyps (see distribution of sclerites on the anthocodium in Figure 9 and biscuit-like sclerites in Figure 10a–c, and compare them with those in Weinberg 1977: plates 13B, 14 and 15). Utinomi (1958: 111) briefly summarizes the nomenclatural changes of *C. studeri* since its original description, but also commented (as unpublished information) that he recognized Koch's species in material from Sagami Bay, Japan. Moreover, Utinomi discussed the idea that *C. studeri* is not comparable to the type species of *Cereopsis*, *C. bocagei* Kent, 1870, or *Bellonella*, and as a result the Japanese author proposed that Koch's species should be included in a new genus, *Kochella* Utinomi, 1958, alluding to a further detailed discussion in a contribution that, to the knowledge of the authors of this article, was never published. *Cereopsis bocagei* was later included in the genus *Bellonella* (see Verseveldt & Bayer 1988: 14), and more recently considered in the genus *Alcyonium* Lamouroux, 1812 (see McFadden & Hutchinson 2004). Neither *Kochella* nor Koch's species were mentioned in the preliminary list of octocorals of Sagami Bay (Utinomi 1962). Currently, *Kochella* is considered a junior synonym of *Daniela* Koch, 1891, a poorly known Mediterranean Nephtheidae. Recently, a well-conserved population attributable to *Daniela koreni* Koch, 1891 (type species of the genus) has been located at Minorca Channel, at a depth of 100 m (J.M. Gili and J. Grinyo, pers. observ.). Further studies on these relatively deep communities will enable us to learn more about *D. koreni*, a relatively large soft coral and the only member of the family Nephtheidae in Mediterranean waters (Grinyo et al. in prep.).

The relatively short description and illustrations of *C. studeri* given by Koch (1891) include key details to support the inclusion of this species within the genus *Nidalia*, as was suggested by May (1900). These are: colony non-ramified, torch-like, all polyps arising from the same level, relatively few polyps in number, partially retracted polyps cylindrical and large, and general sclerite diversity and arrangement. Moreover, there are some details in the original text and figures that can be used as species descriptors, such as prominent points, distinct mesenterial insertions (due to the presence of sclerites as secondary points) and sclerite sizes.

Since its original description, during the last 120 years, this species has remained immersed in a web of taxonomic confusions and synonyms and has also been overlooked in the most recent and complete review of the genus (Verseveldt & Bayer 1988), as well as subsequent descriptive papers on *Nidalia* species (e.g. López-González & Gili 2008).

According to the revision of the genus *Nidalia* (Verseveldt & Bayer, 1988), the geographic distribution of the species of *Nidalia* can be summarized as follows: eight species are present in the Indian Ocean or Western Pacific, while only four have been described from the Western Atlantic (Verseveldt & Bayer 1988). One additional species was recently described from the Mid-Atlantic Ocean (López-González & Gili 2008).

During the general community surveys carried out within the project LIFE+ INDEMARES, a set of 14 colonies of a species of *Nidalia* were collected at the head of Son Bou submarine canyon located at the East of Minorca channel, North Western Mediterranean. Due to the absence of additional references concerning Koch's species and its supposed pertinence and synonyms with members of different families (Alcyoniidae and Nephtheidae), we initially supposed that this newly collected material could represent the existence of an undescribed soft coral species in the Mediterranean. However, the coincidence of some key characters which can be used to identify the genus *Nidalia* as well as other features used to differentiate species in this genus suggested that it actually corresponds to the forgotten species described by Prof. Gottlieb von Koch in the late nineteenth century, *Cereopsis studeri*. After some consultation with the Hessisches Landesmuseum Darmstadt in Germany, where Prof. von Koch was Director of the Department of Zoology for 39 years (1875–1914), we discovered that the type material of *C. studeri* seems to have been lost (J. Köhler, pers. comm.); thus we have also deposited at the Museu de Zoologia (Barcelona) part of the newly collected material of this species to be useful for further studies and consults. Thus, the goal of the present article is the re-description of this material, including the species in the genus *Nidalia*, and the discussion of its relationships with its closest congeners.

Material and methods

The material studied here was collected during the 'INDEMARES-CSIC III, Menorca I' cruise on board the BIO *García del Cid*, equipped with the manned submersible *Jago*, from 3 to 13 September 2010. Fourteen of these colonies were collected using the articulated arm of the submersible. The main goal of this cruise was to study the distribution and diversity of benthic communities in the North Western Mediterranean, within the framework of the LIFE+ INDEMARES project.

The octocorals were fixed in buffered 5% formalin in seawater, and then preserved in 70% ethanol. Other colonies were relaxed and directly fixed in ethanol 100° for examination and future molecular studies. All retraction states and fixation protocols have been considered for the material deposited in museums: retracted, semi-retracted and extended polyps, as well as formalin and ethanol fixed specimens (see 'Material examined').

Fragments of different parts of the colonies were prepared for study by SEM employing the usual methodology, previously described by different authors (e.g. Bayer & Stefani 1988), and permanent mounts were made for light microscopy observation. About 30 sclerites from each type and part of the colony and polyp (crown, introvert, points, surface of the stalk, etc.) were measured, trying to include the complete range of sizes. All sclerite size measurements and illustrations are from the specimen MZB 2011-0001. The colony and sclerite terminology described here mainly follows Bayer et al. (1983). The material studied here has been deposited at the Museu de Zoologia in Barcelona (MZB), and the octocoral reference collection of the research team Biodiversidad y Ecología de Invertebrados Marinos in the University of Sevilla (BEIM-CRO). Eleven colonies have been kept alive in the aquarium rooms at the Institut de Ciències del Mar in Barcelona (ICM-CSIC).

Taxonomy

Order Alcyonacea
Family Nidaliidae Gray, 1869
Genus *Nidalia* Gray, 1835
Nidalia studeri (Koch, 1891) **comb. nov.**
Figures 1–10

Material examined

MZB 2011-0001, 'INDEMARES-CSIC III, Menorca I' cruise, *Jago* dive no. 1139, Minorca Channel, North Western Mediterranean, 39° 48.173′N–4° 8.928′W, 139 m depth, 5 September 2010, 1 whole colony in two halves, 37 mm in length (retracted polyps, formalin fixed). MZB 2011-0002, 1 whole colony (semi-retracted polyps, ethanol fixed). MZB 2011-0003, 1 colony in three parts (extended polyps, formalin fixed). (ICM-CSIC, 2010-INDEMARES-III- 001-011), 11 whole colonies. BEIM (CRO-0067), 1 whole colony (semi-retracted polyps, ethanol fixed). All lots with the same sampling data as the MZB 2011-0001 material.

Description: (Colony MZB 2011-0001)

Colony unbranched, torch-like (Figure 1A,D), 21 mm in length, with elongated stalk about 16 mm, 76.2% of total colony length. Stalk adhering by one or more points to hard substrata. Capitulum dome-shaped, oval to rectangular in section, not distinctly projecting beyond the stalk, 13 mm in maximum diameter. Gonochoric, developing spermatic cysts up to 0.32 mm in diameter.

Capitulum with few polyps (about 18). Calyces prominent, up to 2.4 mm height, usually shorter (1.4–1.9 mm); with eight-lobed edge with spindles, 0.30–0.75 mm in length and 0.019–0.038 mm in width (Figure 6A). Polyps up to 2 mm in diameter at calyx level, capable of complete retraction. Young polyps, about 0.9 mm in diameter, are present on the periphery of the capitulum (Figure 1D). Anthocodiae observed in partially retracted stage. Introvert, observed by dissection, about 3.5 mm in length, probably more, with densely distributed spindles, practically straight, mainly transversally placed in two rows along interseptal space (Figure 2B, 3), 0.10–0.24 mm in length and 0.010–0.019 mm in width (Figure 7C,D). Anthocodiae with distinct crown and points (Figure 1F, 2A, Figure 3). Crown with 28–38 transversally placed lines of curved spindles, 0.33–0.85 mm in length and 0.020–0.034 mm in width (Figure 7B). Points distinctly separated from polyp body (Figure 1F), with 6–9 pairs of slightly curved spindles, 0.37–0.82 mm in length and 0.020–0.041 mm in width (Figure 7A), proximally arranged en chevron, distally arranged parallel to each other (Figure 2A, 3). Intermediate point (secondary points) between principal (interseptal) ones, with spindles 0.12–0.57 mm in length, a larger spindle in the middle of two contiguous principal points basally and smaller spindles distally (Figure 2A, 3). Extended tentacles not seen, densely filled with curved spindles of 0.17–0.46 mm in length and 0.021–0.042 mm in width on the aboral side, larger basally (Figure 8A), narrow spindles of 0.08–0.30 mm in length and 0.009–0.020 mm in width on the lateral sides (Figure 8B), placed transversally distally. Pinnules with platelets 0.06–0.14 mm in length and 0.012–0.026 mm in width on the proximal half or third (Figure 8C,D).

Surface layer of the stalk with spindles arranged mainly longitudinally, but also with some sclerites oriented oblique to the main axis of the stalk, 0.24–0.89 mm in length and 0.015–0.034 mm in width (Figure 6B), ratio length to width 16–25 : 1. Interior of the stalk with spindles in the internal walls between gastrovascular cavities of polyps, arranged as on the surface layer, 0.18–0.75 mm in length and 0.016–0.035 mm in width (Figure 6C), ratio length to width 13–20 : 1.

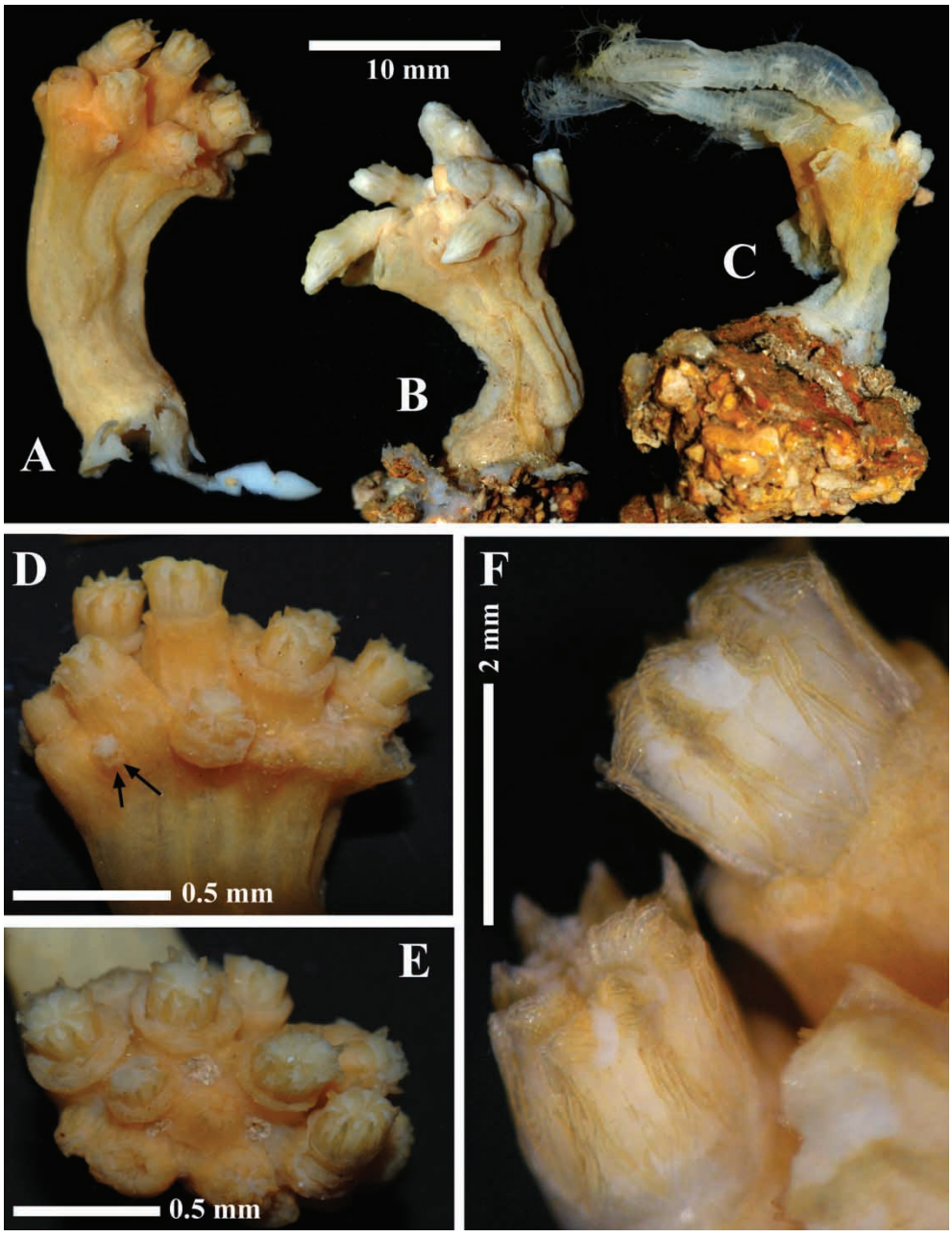

Figure 1. *Nidalia studeri* comb. nov. (A) colony MZB 2011-0001; (B and C) colonies, MZB 2011-0002 and MZB 2011-0003, respectively; (D) detail of the capitulum of the colony MZB 2011-0001, lateral view, showing polyps with their distinct calyces and a small polyp on the periphery of the capitulum (arrowed); (E) capitulum of the holotype, upper view; (F) detail of two polyps showing principal and secondary points, the former distinctly separated from the polyp body.

Sclerite ornamentation sparse, thorny, thorns often blunt (Figure 9).

Stalk and capitulum of preserved colonies light orange due to colour of sclerites, more intense at capitulum; anthocodia whitish in colour with colourless sclerites.

Variations

The general colonial structure of the additional examined material (Figure 1B,C) is quite similar to that of the colony MZB 2011-0001. The stalk is elongated, but shorter than in the above-described specimen. The capitulum is dome-shaped, oval in section, not distinctly projecting beyond the stalk. The form and distribution of the calyces and the sclerites are as in the above-described colony. Points separated from polyp body are distinctly identifiable also in semi-retracted and relaxed specimens (Figure 4). Relaxed specimens show polyps elongated, occupying crown sclerites a little bit more than pharynx plus reproductive area of mesenteries

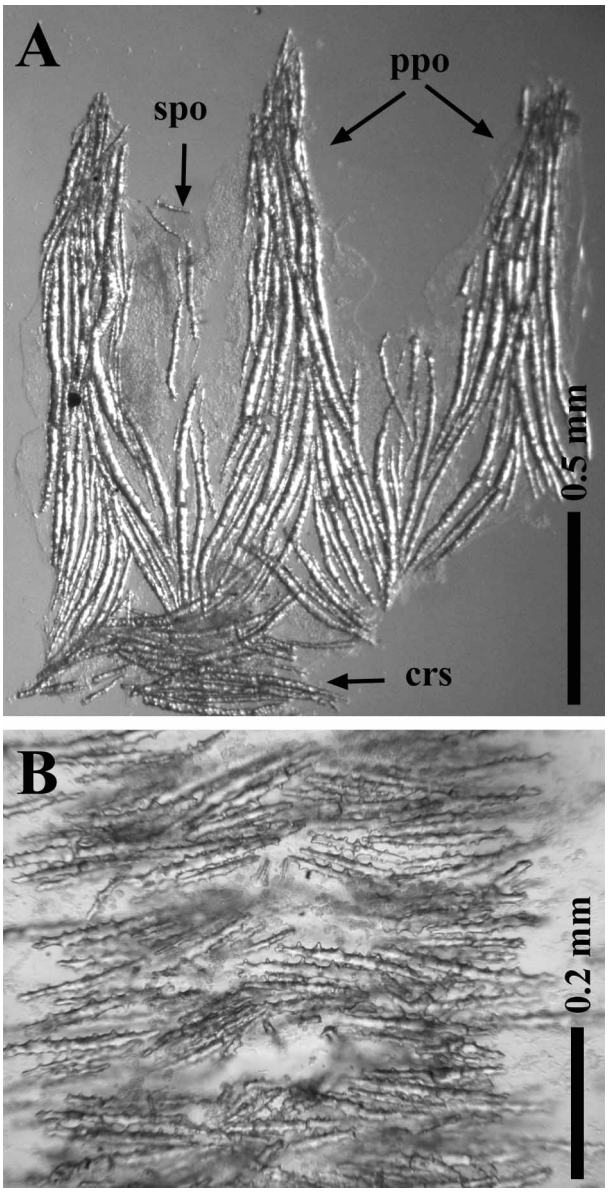

Figure 2. *Nidalia studeri* comb. nov. colony MZB 2011-0001 (A) primary points (ppo), secondary points (spo), and sclerites of the crown (crs), partially dissected; (B) detail of the arrangement of sclerites in the introvert (contracted state) from an interseptal space, partially dissected.

in length, and nearly 40 lines (or more) of sclerites; introvert with sclerites placed transversally in two areas, close to mesenterial insertions (Figure 5E), the central part of the interseptal space being nearly free of sclerites; the tentacles have 14–16 pinnules, sclerites mainly placed on the basal part of the tentacle, with accumulation of cnidocysts distally (Figure 5C,D).

Underwater observations of living specimens show elongated polyps, those in central positions being larger; stalk and capitulum light orange, colour more intense in the capitulum, polyps whitish translucent with a relatively disperse distribution of the sclerites in extended stage (Figure 10).

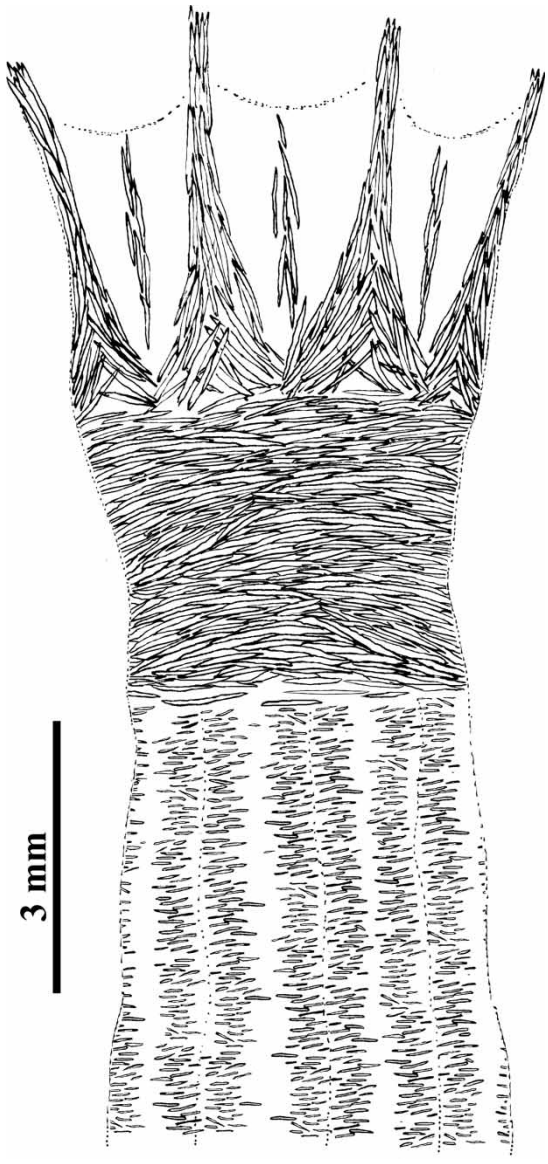

Figure 3. *Nidalia studeri* comb. nov. colony MZB 2011-0001. Anthocodial armature. Tentacles not drawn, notice the presence of principal and secondary points, densely packed crown sclerites, and smaller introvert sclerites mainly arranged in two longitudinal rows per interseptal space.

Habitat and depth distribution

The colonies examined were observed at a depth range of 100–150 m at the border of the continental shelf. Fourteen of these colonies were collected in 139 m depth; however, in a deeper dive, two colonies were observed at 329 m depth growing on a boulder. Colonies formed continuous patches on rocky bottoms and small boulders. Both types of substrate were slightly covered by sediment, but mainly colonized by small colonies of bryozoans or invertebrates forming calcareous colonies. It seems that colonies were more abundant at the edge of rocky outcrops. Colonies grew on mildly inclined substrates and appear to avoid vertical substrates.

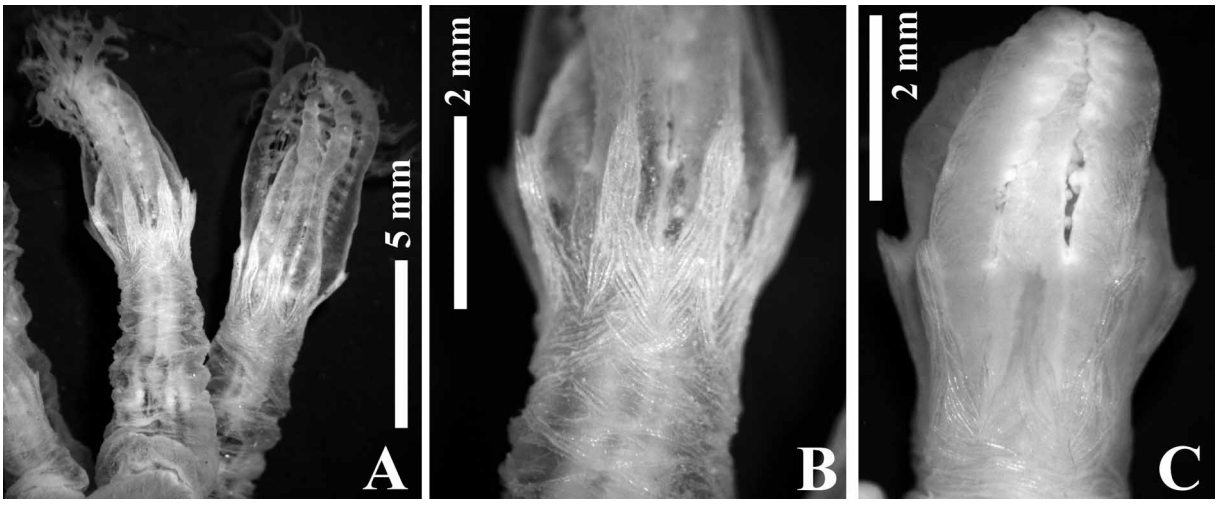

Figure 4. *Nidalia studeri* comb. nov. Colony MZB 2011-0003. (A) Extended polyps; (B) detail of one of the polyps in (A) showing points separate from polyps body. Paratype (MZB 2011-0002). (C) Polyp semi-retracted, showing points distinctively separated from polyp body.

The main species associated with *Nidalia studeri* were the cold-water gorgonian *Callogorgia verticillata* (Pallas, 1766) and an unidentified Plexauridae, the former being more abundant. Different size classes of *C. verticillata* could be distinguished, some colonies had broken branches and dead colonies were also observed. At least two species of the desmosponge genus *Phakellia* Bowerbank, 1862 were observed during the dive where the *N. studeri* was found and collected.

Geographical distribution

At present, *Nidalia studeri* is known from the Western Mediterranean basin (Balearic Islands and Gulf of Naples).

Discussion

Koch's description and illustration correspond with the current conception of a species to be included in the genus *Nidalia*. Moreover, the form of the colony, the presence of well-defined points and distinct mesenterial insertions due to the presence of sclerites as secondary points, as well as the size of sclerites in determined parts of the colony, especially those of the crown (pseudocrown for some authors) and introvert (0.8–0.9 mm for the former and 0.25 mm for the later), and surface of stalk (up to 1 mm), are key characters that we can recognize in our newly collected specimens. These and other characters will be used to compare *Nidalia studeri* with the other recognized congeners to decide if it should be considered a different species in the genus or synonymized under another species name previously described (although in the genus *Nidalia*, only *N. occidentalis* Gray, 1835 was described before Koch's species). *Nidalia occidentalis* clearly differs from *N. studeri* by its mushroom-shaped colony with hemispherical capitulum with its edges distinctly projected beyond the narrow stalk, and introvert without or almost devoid of sclerites (see Verseveldt & Bayer 1988: 59).

According to the review of the genus *Nidalia* carried out by Verseveldt & Bayer (1988), and the recently described species *Nidalia aurantia* López-González & Gili (2008), 13 species are currently recognized as valid in this genus. As revised descriptions and illustrations of these species are relatively recent, additional information about the different anatomical and distributional data of all the *Nidalia* species can be found in the mentioned works.

According to the key to species and descriptions given by Verseveldt & Bayer (1988) and the last described species in the genus (López-González & Gili 2008), *N. studeri* is only morphologically comparable to *N. simpsoni* (Thomson & Dean, 1931) and *N. dissidens* Verseveldt & Bayer, 1988 by having torch-like colonies, a capitulum not laterally flattened, the presence of both principal and secondary points, and a high number of anthocodial sclerites in the crown (at least greater than 15).

However, *N. studeri* is clearly differentiated from *N. simpsoni* and *N. dissidens* by: (1) the distinctive separation of the principal points from polyp body distally; (2) the maximum number of lines of sclerites in crown (about 20 lines in *N. simpsoni*, about 30 lines in *N. dissidens*, but around 40 lines in *N. studeri*); (3) type, size, and arrangement of the sclerites in the introvert (interlacing rods and curved spindles, up to 0.5 mm in length, and often forming small scattered groups of parallel spindles in *N. dissidens*; minute dumb-bell sclerites, 0.08–0.14 mm in length in *N. simpsoni*; while in *N. studeri* these

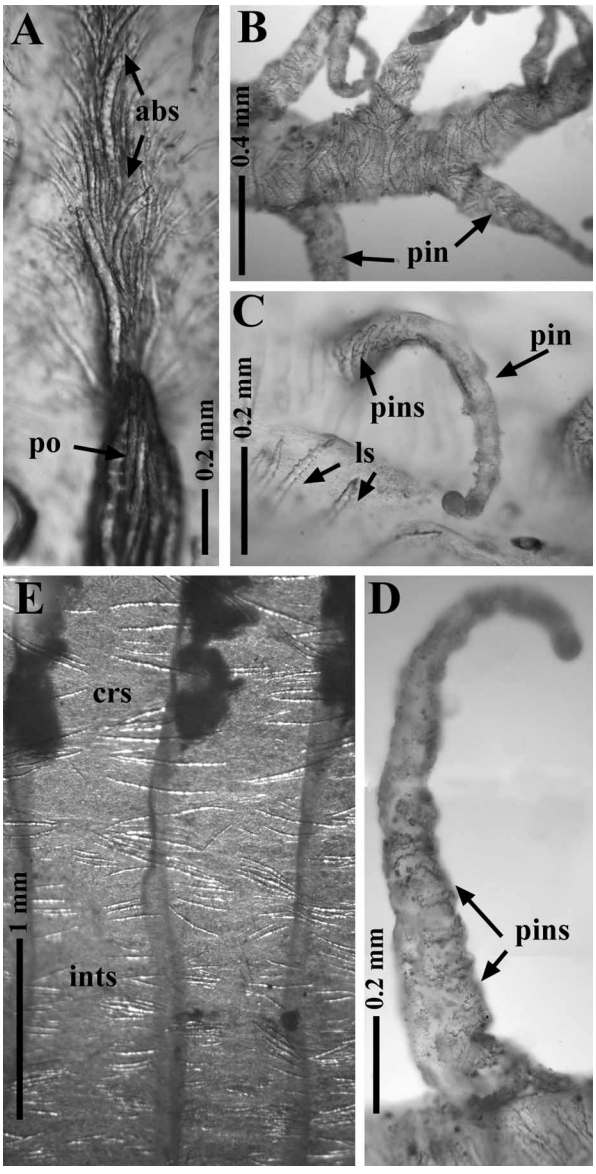

Figure 5. *Nidalia studeri* comb. nov. Colony MZB 2011-0003. (A) Tentacle partially dissected showing distal separate part of the point (po) and aboral tentacular sclerites (abs), aboral side; (B) distal part of tentacle showing sclerites covering the main axis of the tentacle and pinnules (pin) with platelets; (C and D) detail of two pinnulae (pin) showing distribution of pinnular sclerites (pins) on the basal third or half, and groups of cnidocysts distally; (E) detail of the transition of crown and introvert, showing the relatively large and curved crown sclerites (crs, upper part of the photo) and the distinctive arrangement in two rows along each interseptal space of the smaller introvertal sclerites (ints, two-third basal part of the photo).

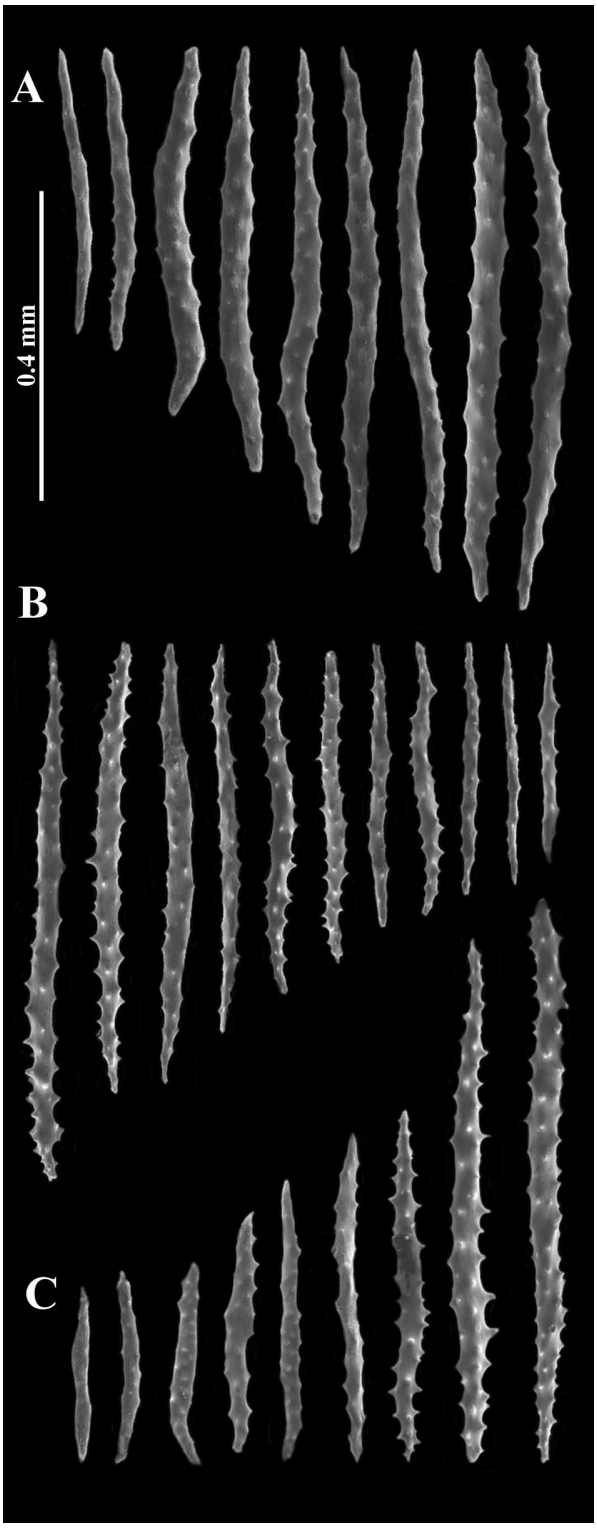

Figure 6. *Nidalia studeri* comb. nov. colony MZB 2011-0001. (A) sclerites from calyx; (B) sclerites from surface of the stalk; (C) sclerites from interior of the stalk. Notice that all sclerites are shown at the same scale.

sclerites are straight spindles, 0.10–0.24 mm in length, transversally arranged in two lines along interseptal space); (4) sclerites of the surface and interior of the stalk (rods and spindles up to 1.2 mm with irregular spines and thorns in *N. dissidens*, thick straight or curved spindles up to 2.60 mm with conspicuously high, often branched warts in *N. simpsoni*, while in *N. studeri* these sclerites are elongated scarcely spinose spindles up to 0.75 mm in length); (5) colour in preserved material (creamy white in *N. dissidens*, the overall colour of *N. simpsoni* is brownish orange except for the small sclerites of

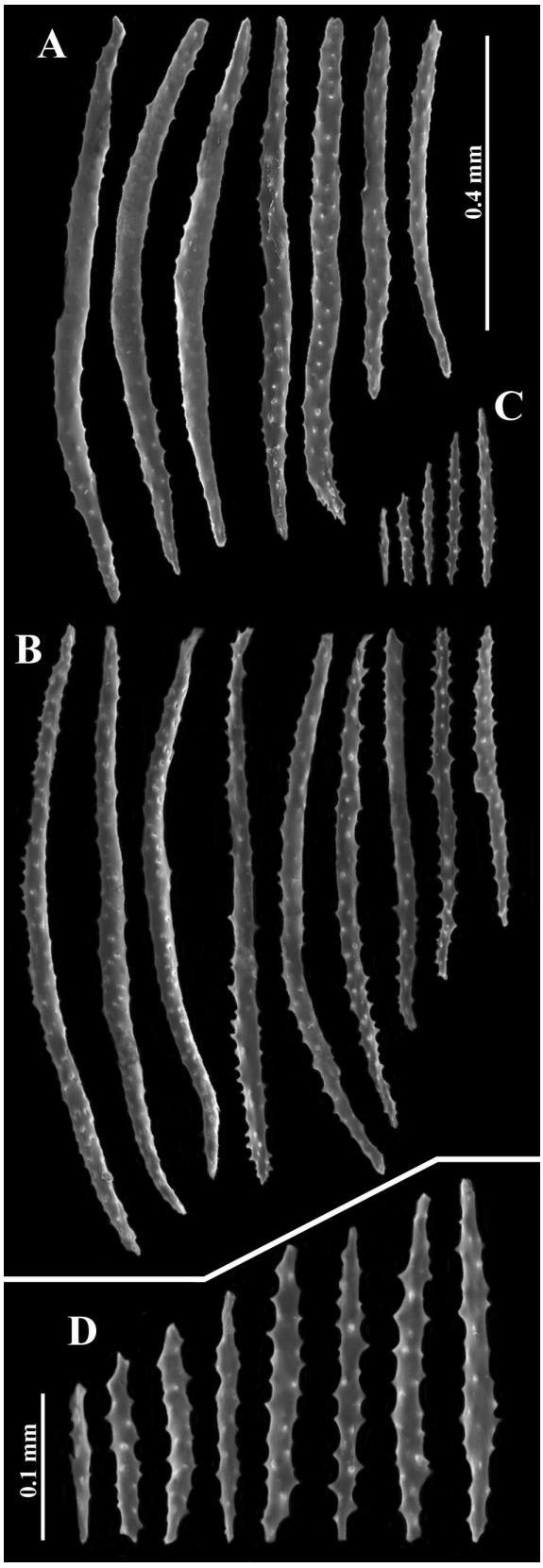

Figure 7. *Nidalia studeri* comb. nov. colony MZB 2011-0001. (A) Sclerites from points; (B) sclerites from crown; (C) sclerites from introvert; (D) sclerites from introvert, magnified. Notice that all sclerites in A to C are shown at the same scale.

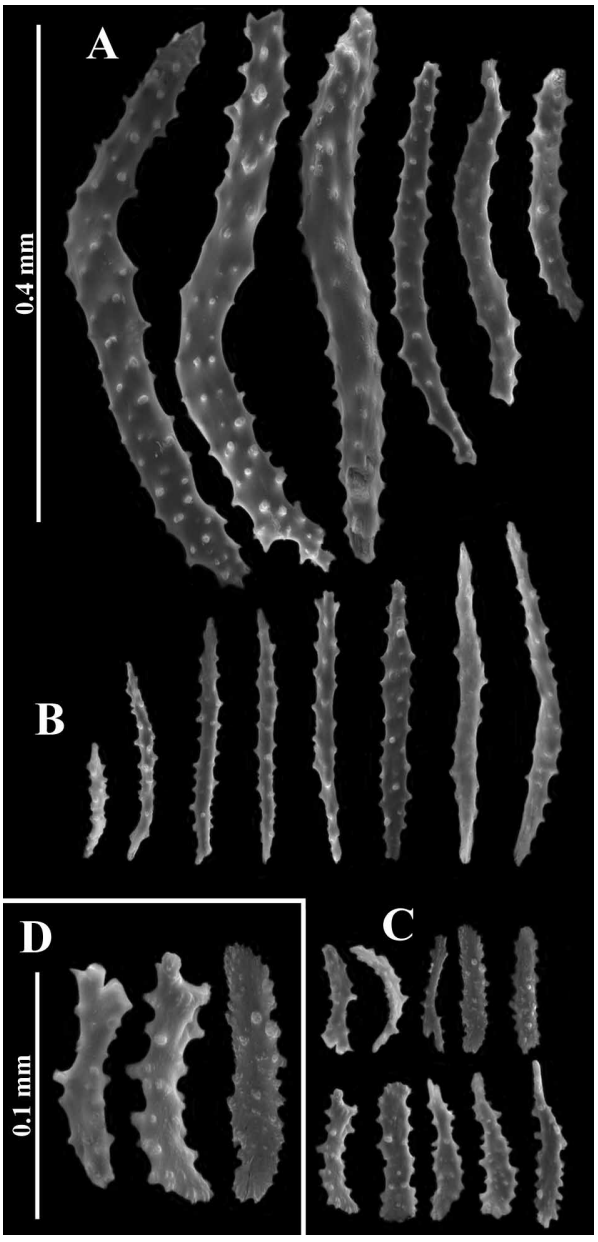

Figure 8. *Nidalia studeri* comb. nov. colony MZB 2011-0001. (A) Sclerites from aboral side of tentacle; (B) sclerites from lateral side of tentacle; (C) plates from pinnules; (D) plates from pinnules, magnified. Notice that all sclerites in A to C are shown at the same scale.

the pinnules and introvert which are dull orange or reddish orange, while *N. studeri* is light orange, more intense in the capitulum due to the high density of sclerites (Faulkner 1974; Verseveldt & Bayer 1988; present study).

With respect to the geographical distribution of these three species, *N. simpsoni* is from the Indonesian Archipelago and Palau Islands, *N. dissidens* is from the Straits of Florida, Bahamas and Lesser Antilles (Western Atlantic) and *N. studeri* is from the North Western Mediterranean.

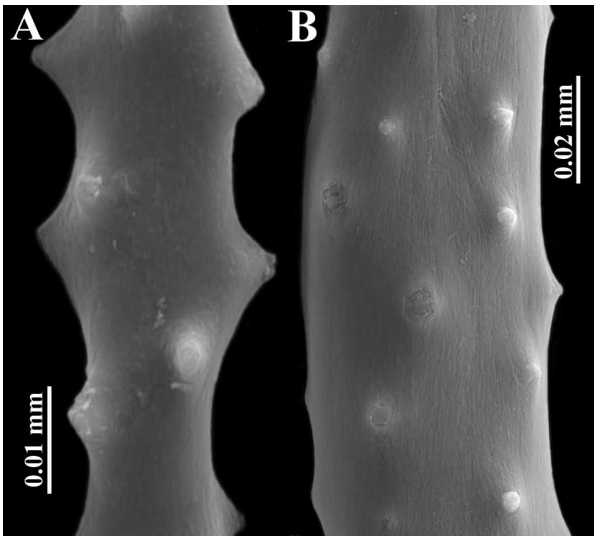

Figure 9. *Nidalia studeri* comb. nov. colony MZB 2011-0001. (A) Surface of a sclerite from introvert. (B) Surface of a sclerite from point.

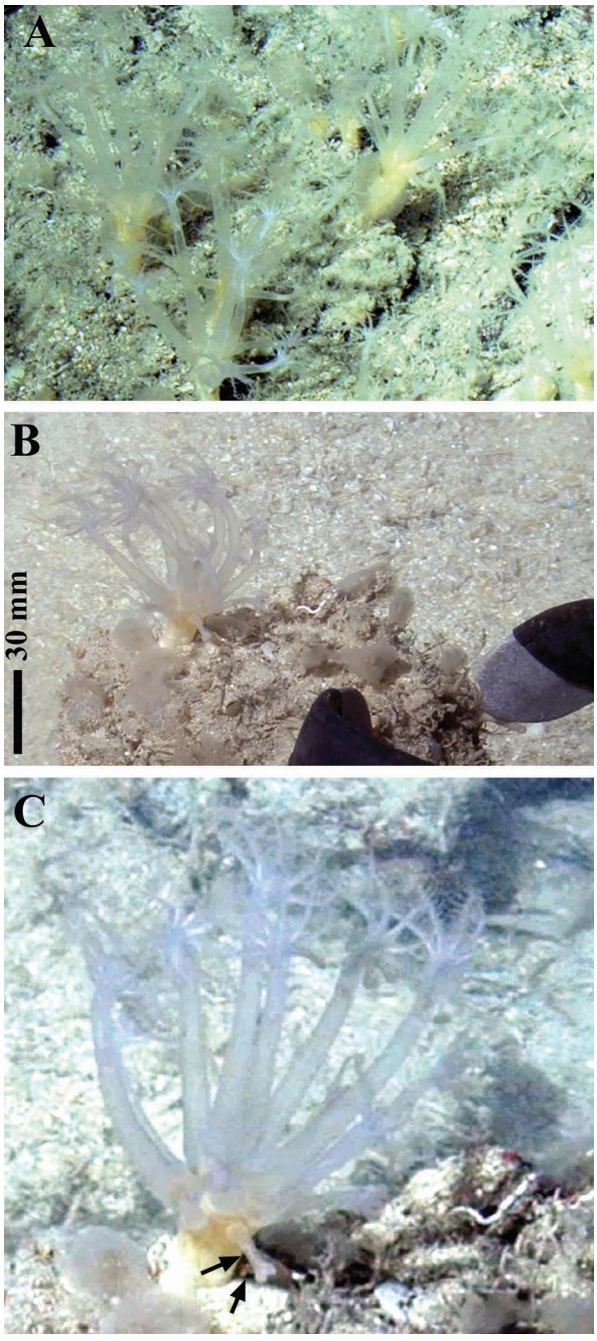

Figure 10. *Nidalia studeri* comb. nov. Living colonies photographed in situ during JAGO dive. (A) About eight colonies of *Nidalia studeri* on the bottom. (B) One of the colonies collected by JAGO arm. (C) The same colony in (B), magnified, the smaller size of the polyp in the periphery (arrowed) can be seen.

Nidalia aurantia is the geographically closest congener to *N. studeri*. The former species was recently described from south of the Azores (López-González & Gili 2008), and shares with *N. studeri* several characters: (1) colour, both are light orange; (2) torch-like colonies; (3) relatively numerous anthocodial sclerite rows in the crown (15–17 for *N.aurantia*, but up to nearly 40 rows in *N. studeri*). However, both species are clearly different regarding: (1) points (distinctly separated from the polyp body, and with secondary points in *N. studeri*, these features absent in *N. aurantia*); (2) calyces (prominent in *N. studeri*, but low in *N. aurantia*); (3) introvert (longer, with sclerites up to 0.24 mm in *N. studeri*, but shorter with scarce sclerites up to 0.5 mm in *N. aurantia*); (4) crown sclerites (spindles up to 0.85 mm in length in *N. studeri*, but up to 1.23 mm in *N. aurantia*); and (5) inner sclerites of the stalk (nearly straight spindles in *N. studeri*, while these sclerites are sometimes shortly branched in *N. aurantia*).

The separation (or not) of the points from the polyp body is a specific character previously used in the genus *Nidalia* (see Verseveldt & Bayer, 1988) and other soft coral genera like *Sphaeralcyon* López-González and Gili, 2000 (see López-González & Gili 2000, 2005).

Two other *Nidalia* species are also present in Atlantic waters (West Indian Region), *N. occidentalis* Gray, 1835 and *N. deichmannae* Utinomi, 1954. However, both species have a smaller number of anthocodial crown sclerites rows (less than 20 rows in *N. occidentalis* and *N. deichmannae*, but up to nearly 40 rows in *N. studeri*). Besides, their colonies are mushroom-shaped, having a hemispherical capitulum with its edges distinctly projecting beyond a narrowed stalk, and the introvert lacks sclerites (*N. occidentalis*) or at most have a few proximally and distally (oval and rod-shaped, 0.03–0.05 mm long sclerites sometimes with a median constriction in *N. deichmannae*). However, *N. studeri* has a torch-like colony with a dome-shaped polyparium not distinctly projecting beyond stalk, and an introvert with

numerous sclerites (spindles, 0.10–0.24 mm long sclerites) along its entire length.

As has been previously stated, *Nidalia* species are mostly concentrated in the Indian Ocean and the western sector of the Indo-Pacific Ocean. In the Atlantic Ocean they are mainly found in the Caribbean area. A total of five species have been described in the Atlantic Ocean, four of which have been found in the West Indian Region, and one in the Mid-Atlantic (López-González & Gili 2008). With the rediscovery of *N. studeri*, 120 years after its original description in the Western Mediterranean basin, this is the first time that the genus *Nidalia* and the family Nidaliidae are reported with certainty for the Mediterranean Sea.

As occurred in the case *N. studeri*, the use of increasingly sophisticated equipment in benthic fauna surveys such as remotely operated vehicles (ROV's) and manned submersibles is considerably improving our knowledge of the structure of shelf and deep-sea benthic communities, especially necessary for the study of hard bottom fauna, and enabling the collection of delicate specimens, not collected or probably damaged and overlooked with traditional trawling gears. In the near future, we will probably have the opportunity to increase our knowledge of the diversity of this benthic small-sized (a few centimetres) fauna from the shelf (benthic cnidarians being a good example).

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