

Highly diverse epifaunal bryozoans on the invasive alien species *Rugulopteryx okamurae* (Ochrophyta) in the Strait of Gibraltar area, with the description of a new species

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Mediterranean Marine Science, 26 (4) 2025

New Records of bryozoans for the Alboran Sea and the area of the Strait of Gibraltar Spanish marine subdivisions, Spanish and Mediterranean waters found epiphytizing fronds of the invasive Asian alga *Rugulopteryx okamurae* in the Strait of Gibraltar, updated descriptions and ecology, biogeographical distribution and taxonomic remarks.

Class Gymnolaemata Allman, 1856

Order Cheilostomatida Busk, 1852

Family Aeteidae Smitt, 1868

***Aetea lepadiformis* (Waters, 1906)**

Aetea anguina Waters, 1879: 114, figs. 11-4;

Aetea lepadiformis: Waters, 1906: 12, fig. 13; Balduzzi *et al.*, 1991; Chimenz Gusso *et al.*, 2014: 58, fig. 2.

Material examined: MNCN 25.03/4550, Punta Carnero, Bahía de Algeciras. One sample with several zooids alive and fertile. Part of the material used to Scanning Electron Microscope (SEM) pictures from the original sample.

Short description: Colony adnate and branching; Autozooid formed by a proximal portion adnate (381-409-425 µm length [SD = 20; N = 4] x 119-145-168 µm width [SD = 21; N = 4]), weakly punctate and corrugate (Fig. S1A, B); distal portion erect [643-827-976 µm (SD = 145; N = 4) x 70-82-93 µm width (SD = 10; N = 4)], tubular, smooth except by few irregular rings near the peristomial basal area and in the level of the frontal membrane (Fig. S1B, C). Opesia occupying distal 2/5 of the erect part (269-344-455 µm length [SD = 91; N = 4] x 75-92-103 µm width [SD = 15; N = 3]). Ovisac A-type, smaller than autozooid (221 µm length [N = 1]), brooding from the basal portion, with a relatively long, thin tube, ringed and flexible expanded to form the distal, triangular, bag-shaped rigid portion (Fig. S1C, D).

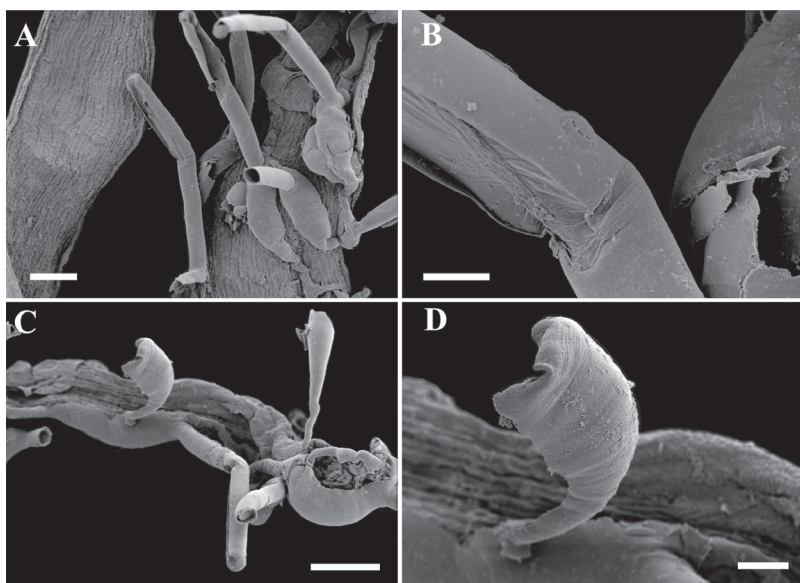


Fig. S1. *Aetea lepadiformis* (Waters, 1906). A. General view of some zooids; B. Detail of a zooid showing rings in the opesia basal area; C. General view of the colony with autozooids and ovisac A-type; D. Detail of an ovisac A-type. Scale bars: 200 µm (A, C); 50 µm (B, D).

Ecology: this species seems to settle preferably on *Posidonia oceanica* leaves (Balduzzi *et al.*, 1991; Koçak *et al.*, 2002; Chimenz Gusso *et al.*, 2014; Lepoint *et al.*, 2014), but it can probably colonize other vegetable substrata,

Geographic distribution: This is the first record for Spanish waters and Alboran Sea. Previous records of *A. lepadiformis* are from Gulf of Naples, Western Sicily and Western Sardinia coasts, Ligurian Sea, Greek Sea, Northern Adriatic, and Turkey (Balduzzi *et al.*, 1991; Koçak *et al.*, 2002; Chimenz Gusso *et al.*, 2014; Lepoint *et al.*, 2014; Gerovasileiou & Rosso, 2016).

Family Scrupariidae Gray, 1848

***Scruparia chelata* (Linnaeus, 1758)**

Sertularia chelata Linnaeus, 1758.

Scruparia chelata, Hastings, 1941: 465, fig. 1A; Álvarez, 1987: 216.

Material examined: MNCN 25.03/4551, Bajo Cabezos, several colonies alive, one of them used to SEM; MNCN 25.03/4552, Bolonia, several colonies alive, two of them used to SEM; MNCN 25.03/4553, Punta Carnero, several colonies alive; MNCN 25.03/4554, Guadalmesí, several colonies alive.

Short description: Colony erect, branching, uniserial chains of autozooids, budded from a basal stolon (Fig. S2A). Basal autozoid with a ringed or twist tubular proximal portion (Fig. S2A). Autozooids with an oval opesia occupying half its length and dipping obliquely towards the distal direction. Zooids forming chains with new autozooids budded distally; new branches originating from budding in the frontal region just proximally to the opesia (Fig. S2B); and lateral regions can give arise to rootlets. Ovicell not observed.

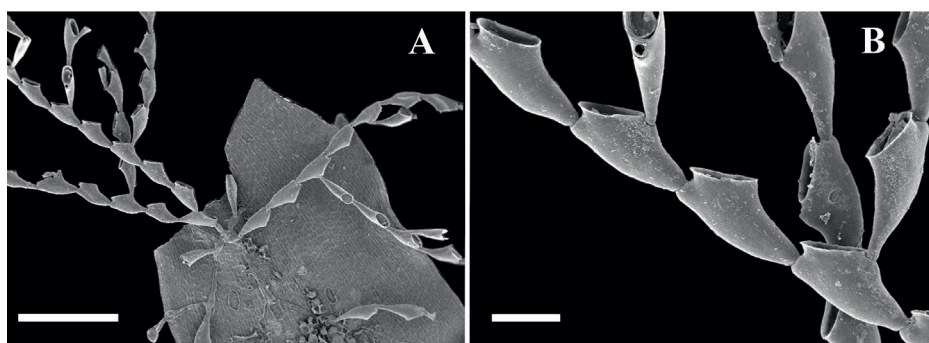


Fig. S2. *Scruparia chelata* (Linnaeus, 1758). A. General view of a colony; B. Detail of some zooids. Scale bars: 1 mm (A); 200 μm (B).

Ecology: this species can be found on seaweeds, other bryozoans, porifera, molluscs, and other substrata (Hastings, 1941; De Blauwe, 2009; Koçak *et al.*, 2014; Reverter-Gil *et al.*, 2014; Beukhof *et al.*, 2016; Reverter-Gil & Souto, 2021); also, it can be found mixed with *Scruparia ambigua* (d'Orbigny, 1841), the most similar species (Hastings, 1941).

Geographic distribution: Mediterranean Sea; Northeastern Atlantic (Portugal and North Spain), North Sea (Hastings, 1941; Álvarez, 1987; Zabala & Maluquer, 1988; Aldáriz *et al.*, 1997; De Blauwe, 2009; Koçak *et al.*, 2014; Reverter-Gil *et al.*, 2014; Beukhof *et al.*, 2016), and South Africa (Boonzaaier-Davids *et al.*, 2020). Although this species has already been recorded from surrounding area of the Strait of Gibraltar (Tangier coast, Morocco) (Barroso, 1924), it is the first record for the Spanish Marine Strategy area Alboran Sea and the Strait of Gibraltar (or ESAL, *i.e.*, Spanish Estrecho y Alborán).

Family Bugulidae Gray, 1848

***Crisularia serrata* (Lamarck, 1816)**

Bugula serrata Lamarck, 1816; Chimenz Gusso *et al.*, 2014: 75;

Bugula germanae Calvet, 1902: 8, pl. 1, fig. 1-3; Prénant & Bobin, 1966: 497, fig. 163; Harmelin, 1968: 1192, figs. 2 (7-8), 3 (1-2); Zabala, 1986: 346, figs. 104a, b, pl. 1D; Zabala & Maluquer, 1988: 102, fig. 108, pl. 5E;

Crisularia serrata Fehlaue-Ale *et al.*, 2015: 9; Rosso & Di Martino, 2016: 575.

Material examined: MNCN 25.03/4555, Ceuta; one colony alive, infertile used to SEM.

Short description: Small and translucent colony, branched (Fig. S3A). Autozooids elongate (355-408-552 μm length [SD=56; N=13] x 114-125-138 μm width [SD=10; N=9]), disposed in biserial branches with type-3 bifurcation; 2:1 distal spines, being the most proximal external spine sometimes vestigial or more developed; frontal membrane occupying almost half length zooidal (169-235-307 μm length [SD=41; N=12]) (Fig. 3SB, C). Avicularia small (58-82-135 μm length [SD=28; N=11] x 109-123-132 μm width [SD=7; N=8]) and positioned proximally on external border of the zooid (Fig. 3SB, C). Ancestrula in cup-shaped with seven spines, being one antero-median and three in each costal (Fig. S3D). Ovicell not observed.

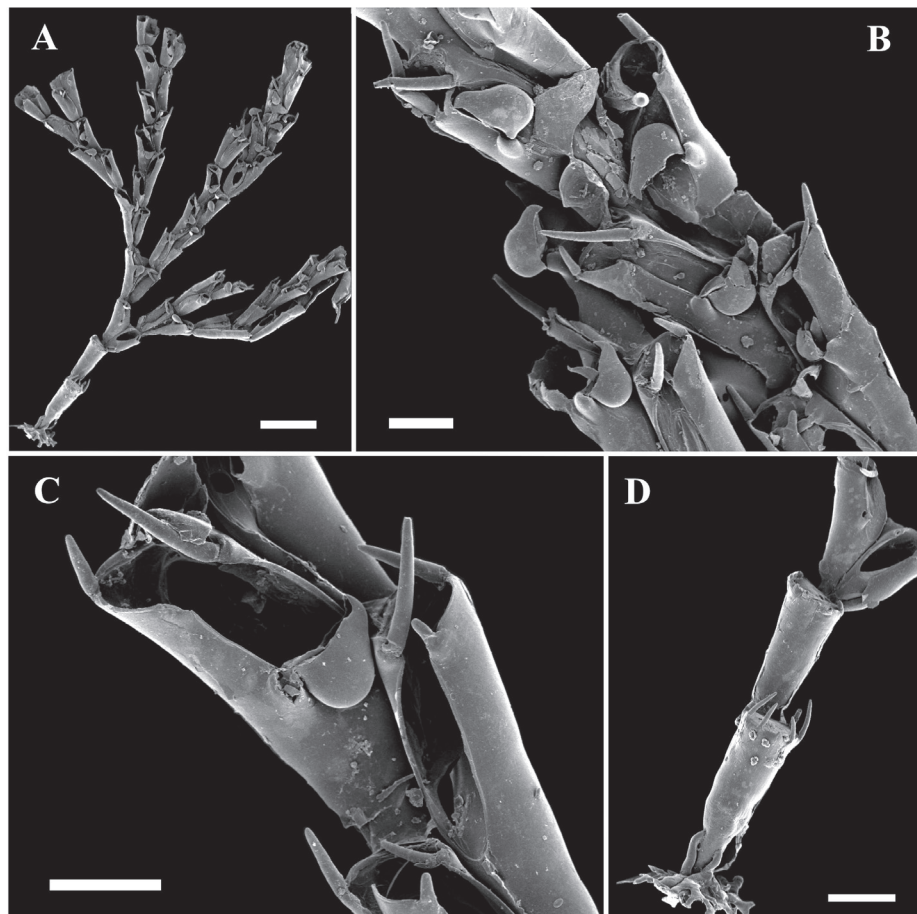


Fig. S3. *Crisularia serrata* (Lamarck, 1816) A. General view of a complete colony; B. Detailed view of two branches; C. Some zooids showing spines and avicularium; D. Detail showing ancestrula and successive zooids. Scale bars: 500 μm (A); 100 μm (B, C); 200 μm (D).

Ecology: Colonies can be found on algae (e.g. *Cystosera*, *Halopteris*, coralline algae) (Calvet, 1902; Harmelin, 1968; Zabala, 1986) and artificial substrata (Chimenez Gusso *et al.*, 2014). It is recorded from shallow water (10-40 m) but also at 70 m depth (Zabala, 1986).

Geographic distribution: This species is considered native from Indo-Pacific (Australia) and non-indigenous in the Mediterranean Sea, being recorded from Corsica, Lazio, Vulcano, Ustica (Italy), Greek Sea, and Cataluña (Spain) (Calvet, 1902; Zabala, 1986; Chimenez Gusso *et al.*, 2014; Gerovasileiou & Rosso, 2016; Servello *et al.*, 2019). This is the first record for the Alboran Sea.

Family Beaniidae Canu & Bassler, 1927

***Beania cylindrica* (Hincks, 1886)**

Diachoris hirtissima f. *cylindrica* Hincks, 1886: 263.

Beania hirtissima forma *cylindrica*: Gautier, 1962: 96; Zabala, 1986: 332, fig. 95c; Zabala & Maluquer, 1988: 101, figs. 174, 177.

Beania cylindrica: Hayward & McKinney, 2002: 22, fig. 9; Chimenz Gusso *et al.*, 2014: 64, fig. 7.

Material examined: MNCN 25.03/4556, Bolonia; four colonies alive and no fertile. One of them used to SEM.

Short description: Colony loosely adherent, fragile, and transparent. Autozooids elongate (822-850-888 μm length [SD=25; N=6] x 250-322-402 μm width [SD=54; N=7]), tapered proximally, and truncate distally; frontal surface membranous with an operculum positioned distally (Fig. S4A). Six long and erect spines around the rim of operculum, eight to ten pairs of spines along the zooidal border and bending over the opesia, and some more spines on basal and lateral surface (Fig. S4B). Six connective tubules may develop to form new buds, being one proximal, one distal and two pairs lateral (Fig. S4C). Ovicell not observed.

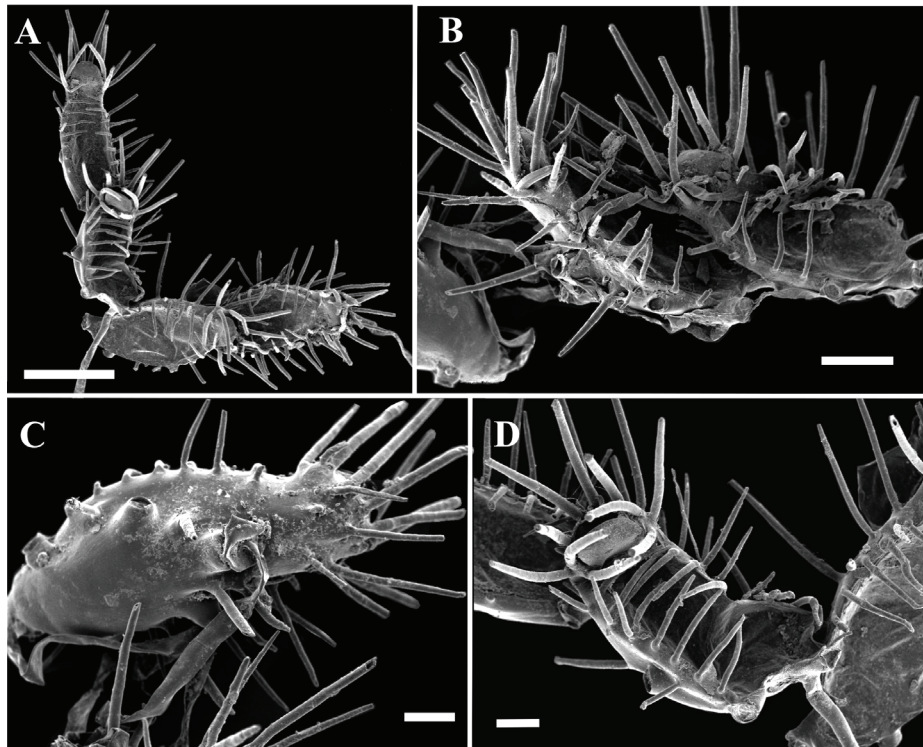


Fig. S4. *Beania cylindrica* (Hincks, 1886) A. General view with four zooids; B. Detail of zooids showing frontal and lateral view; C. Dorsal view of the zooids showing connective tubules and spines; D. Detail of two zooids in frontal view. Scale bars: 500 μm (A); 400 μm (B); 100 μm (C, D).

Ecology: colonies can be found in shallow waters and on different substrata: soft and coralline algae, coralligenous bottom, sponges and *Posidonia* (Prenant & Bobin, 1966; Hayward & McKinney, 2002; Chimenz Gusso *et al.*, 2014).

Geographic distribution: Spain (Cataluña), France (Marseille), Italy (Corsica), Greek Sea, Tunisia, Adriatic Sea (Zabala, 1986; Hayward & McKinney, 2002; Chimenz Gusso *et al.*, 2014; Gerovasleiou & Rosso, 2016). This species has been found in the Bolonia station, being the first record for the ESAL marine subdivision.

Family Candidae d'Orbigny, 1851

***Cradoscrupocellaria ellisi* (Vieira & Spencer-Jones, 2012)**

Scrupocellaria ellisi Vieira & Spencer-Jones, 2012: 34, figs. 4, 18-23, 25, 27;

Cradoscrupocellaria ellisi Vieira *et al.*, 2013: 41, fig. 20; Reverter-Gil *et al.*, 2019: 228, fig. 2d.

Scrupocellaria reptans, Zabala & Maluquer, 1988: 97, figs. 159-160.

Material examined: MNCN 25.03/4557, Bolonia: eight colony fragments, half of them with ovicells; MNCN 25.03/4558, Punta Carnero: two colony fragments no fertile; MNCN 25.03/4559, Ceuta: one colony fragment fertile.

Short description: Colony erect with bifurcate branches, fixed to the substrate by smooth rhizoids (Fig. S5A). Autozoooid elongate (294-**399**-508 μm length [SD=52; N=19] x 128-**165**-193 μm width [SD=18; N=18]), frontal membrane occupying more than half of the total length (226-**245**-266 μm length [SD=11; N=19]); long (up to 310 μm), jointed and hollow spines disposed in 3:2, and 5 in the axial zoooid (Fig. S5A, B); large and very branched scutum, ending in eight to 13 stout projections, covering almost whole opesia (Fig. S5B). Avicularium frontal varying in size: median to giant (101-**146**-180 μm length [SD=32; N=11] x 78-**118**-186 μm width [SD=31; N=10]), located proximally, near the internal margin, forming a longitudinal middle line, rostrum serrated laterally, and very curved tip like to hook, directed forward, mandible triangular with hooked tip (Fig. S5B, C). Lateral avicularium absent (Fig. S5C). Vibracular chamber basally located with a transversal setal groove; seta longer than zoooidal width (Fig. S5D); single axial vibraculum (Fig. S5E). Ovicell hyperstomial, (149-**161**-173 μm length [SD=17; N=2] x 193-**201**-209 μm width [SD=11; N=2]) globous with 12-18 pores scattered (Fig. S5F).

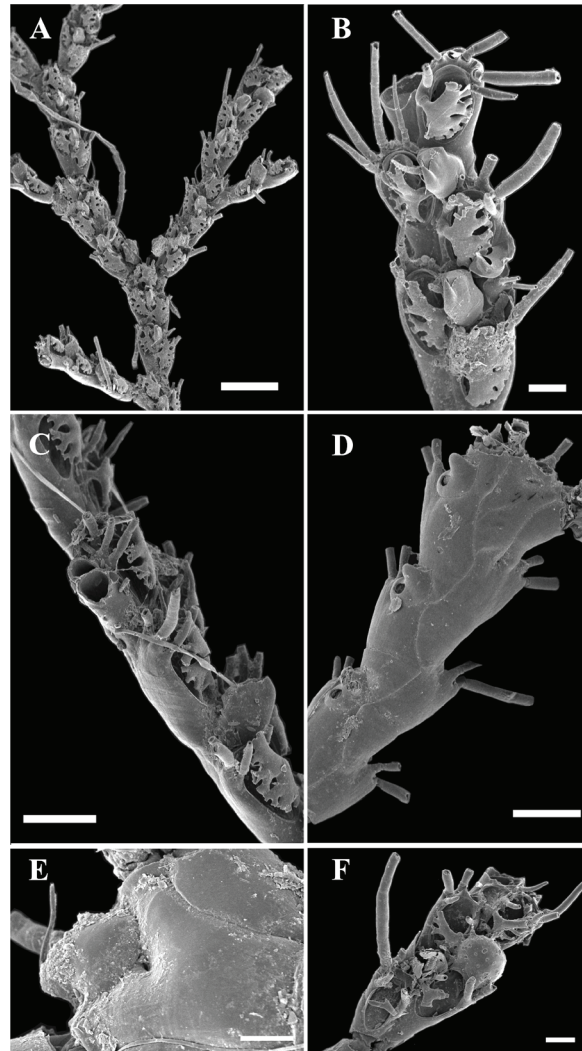


Fig. S5. *Cradoscrupocellaria ellisi* (Vieira & Spencer-Jones, 2012) A. General view; B. Branch showing some zooids with spines, scutum and giant avicularia; C. Lateral view of the branch with absence of lateral avicularia; D. Dorsal view showing vibracular and frontal distal spines; E. Dorsal view showing an axial avicularium; F. Part of the branch with a fertile zooid. Scale bars: 500 μm (A); 100 μm (B, F); 200 μm (C, D); 50 μm (E).

Ecology: this species is mentioned to occur on algae and shells (Reverter-Gil *et al.*, 2019).

Geographic distribution: widespread in the north-east Atlantic, Adriatic Sea and Tasmania (Reverter-Gil *et al.*, 2019); in the Mediterranean Sea the occurrence (mentioned as *Scrupocellaria reptans* by Zabala & Maluquer, 1988)

is uncertain (see Vieira *et al.*, 2012). This is the first record for the Alboran Sea.

Family Haplopomidae Gordon in De Blauwe, 2009

***Haplopoma bimucronatum occiduum* (Waters, 1879)**

Eschara bimucronata Moll, 1803: 65, pl. 4, fig. 18a-c.

Haplopoma bimucronatum, Ryland, 1963: 17, figs. 1a-c, 2e; Gautier, 1962: 121; Hayward & Ryland 1979: 238, fig. 102; Álvarez, 1987: 219.

Haplopoma bimucronatum f. *occiduum* Waters, 1879: 34, pl. 8, fig. 2-3; Gautier, 1962: 122; Zabala & Maluquer, 1988: 123, fig. 328; Chimenz Gusso *et al.*, 2014: 170, fig. 86.

Material examined: MNCN 25.03/4560, Guadalmezi; one small colony, infertile. Material used to SEM.

Short description: A single, small, almost spot-like colony encrusting on the substrate, formed by a dozen zooids. Zooid elongate (406-**442**-560 μm length [SD=44; N=12] x 179-**223**-277 μm width [SD=29; N=12]), more or less hexagonal, separated by deep furrows, frontal surface rugose with scattered large pores; ascopore small and rounded (21-**25**-28 μm diameter [SD=2; N=12]); a small lunate umbo formed behind the ascopore, sometimes masked it (Fig. S6A, B). Orifice D-shaped (55-**67**-75 μm length [SD=6; N=12] x 87-**101**-124 μm width [SD=9; N=12]), without condyles, flanked by two lateral mucrone (Fig. S6A, B). Ovicell not observed.

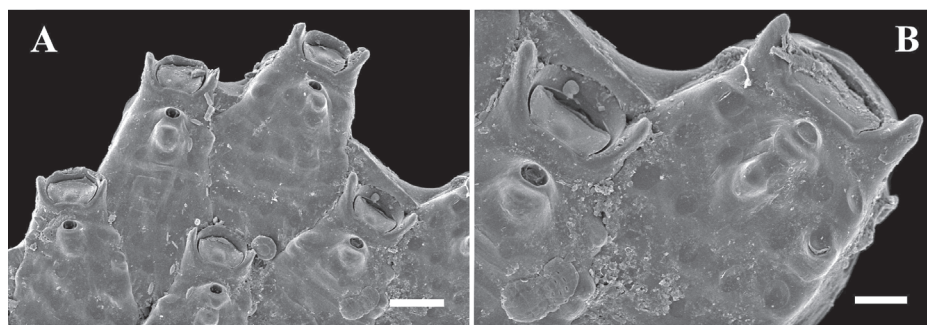


Fig. S6. *Haplopoma bimucronatum occiduum* (Waters, 1879) A. Detail of the colony; B. Detail of zooids. Scale bars: 100 μm (A); 50 μm (B).

Ecology: colonies can be found on *Posidonia*, red algae in shallow waters (Gautier, 1962; Hayward & Ryland, 1979; Chimenz Gusso *et al.*, 2014).

Geographic distribution: North Atlantic, Mediterranean Sea: France, Tunisia, Spain (Cataluña) (Gautier, 1962; Hayward & Ryland, 1979; Zabala & Maluquer, 1988). This is the first record for the Alboran Sea.

Family Microporellidae Gray, 1848

***Microporella modesta* Di Martino, Taylor & Gordon, 2020**

Microporella modesta Di Martino *et al.*, 2020: 23, fig. 11; Di Martino & Rosso, 2021: 18, fig. 7.

Microporella ciliata (Pallas), Hayward & McKinney, 2002: 83, fig. 37 e-j;

Microporella cf. *ciliata* (Pallas), Chimenz Gusso *et al.*, 2014: 189, fig. 101.

Material examined: MNCN 25.03/4561, Bajo Cabezos: two colonies fertile and five colonies no fertile; MNCN 25.03/4562, Bolonia: 39 colonies fertile and 15 colonies no fertile; MNCN 25.03/4563, Punta Carnero: seven colonies fertile; MNCN 25.03/4564, Guadalmesí: two colonies no fertile.

Short description: Colony encrusting (Fig. S7A). Zooids rhomboidal (313-378-453 μm length [SD=40; N=20] x 205-256-325 μm width [SD=29; N=21]) with pustulosis frontal shield and perforate by small pseudopores (Fig. S7B, C); ascopore reniform to elliptical with aperture in crescent-shaped, lined by thin denticles, frequently hidden by mucro with different level of development (Fig. 7A-E). D-shaped orifice (56-68-78 μm length [SD=5; N=30] x 85-99-117 μm width [SD=10; N=30]) with two condyles and several smaller tooth between them on the proximal border. Six hollow, jointed and long oral spines in infertile zooids (Fig. S7E) and a pair of visible spines in the fertile zooids (Fig. S7D). Large avicularium, located proximally to ascopore, directed distal-laterally, rostrum channelled (69-90-109 μm length [SD=11; N=28] x 64-76-89 μm width [SD=7; N=20]), raised from the frontal surface, mandible triangular with needle-shaped tip, crossbar complete (Fig. S7B- F). Ovicell hyperstomial (163-197-225 μm length [SD=21; N=11] x 207-243-270 μm width [SD=21; N=12]), not personate, surface similar to the frontal shield, usually with a central umbo (fig. S7D).

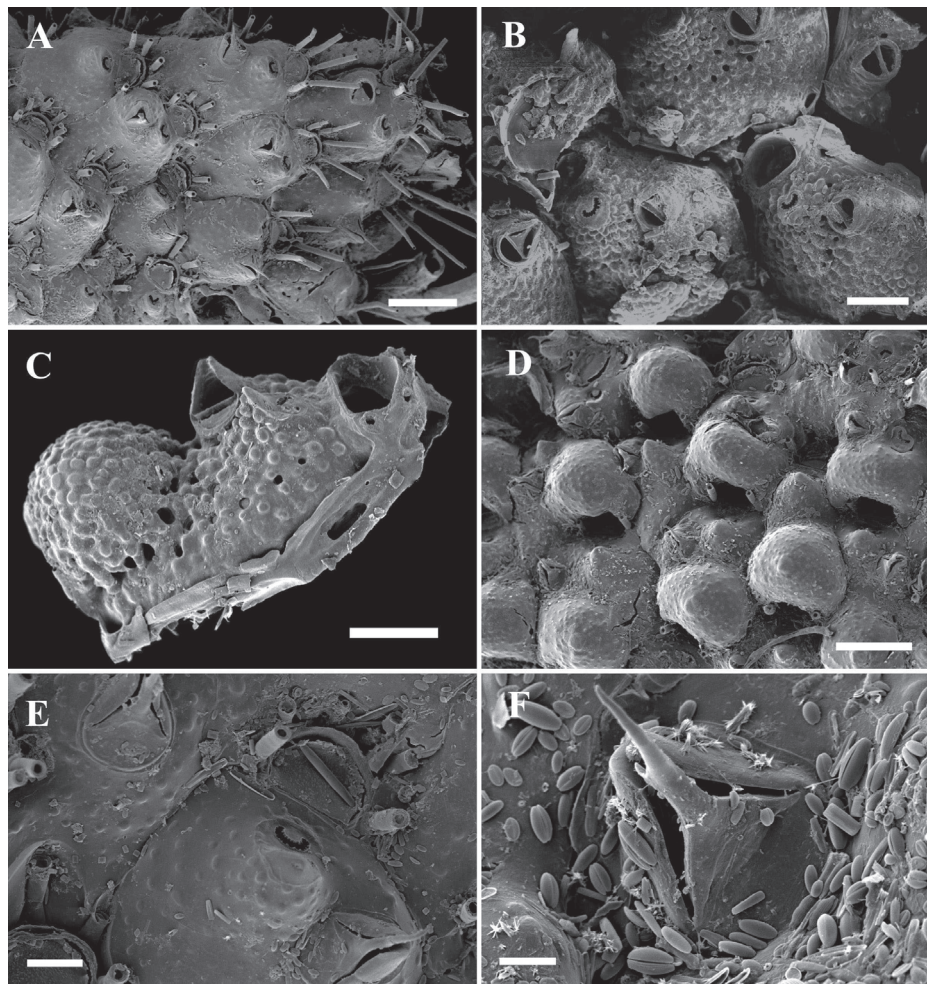


Fig. S7. *Microporella modesta* Di Martino *et al.*, 2020 A. General view of a colony; B. Detail of some zooids; C. Lateral-frontal view of a zooid and an ovicell from an adjacent zooid; D. Some fertile zooids; E. Detail of a complete zooid; F. Detail of an avicularium with a triangular mandible with needle-shaped tip. Scale bars: 200 μm (A, D); 100 μm (B, C); 50 μm (E); 20 μm (F).

Ecology: Colonies can be found on seagrass *Posidonia* leaves and *Laminaria rodriguezii*, soft and coralline algae, bryozoans (*Cellaria*), mollusc shells, artificial substrata (Di Martino & Rosso, 2021; comm. personal LVR); one of the epiphytic species more abundant/frequent on *R. okamurae*.

Geographic distribution: widely distributed in the Mediterranean Sea (Algeria, Iberian-Provençal basin, Tyrrhenian, Ionian, Sicily Strait and Adriatic Sea) (Di Martino & Rosso, 2021). This is the first record for Spanish waters

and Alboran Sea.

Family Celleporidae Johnston, 1838

***Celleporina mediterranea* Souto, Reverter-Gil & De Blauwe, 2015**

Celleporina mediterranea Souto *et al.*, 2015: 730, figs. 8-9.

?*Celleporina hassallii* var. *tubulosa*: Gautier, 1962, p. 247.

Celleporina sp.: Souto *et al.*, 2010, p. 1427, Fig. 7.

Material examined: MNCN 25.03/4565, Guadalmeś; one colony alive and fertile; MNCN 25.03/4566, Punta Carnero: one colony alive and fertile.

Short description: Colony encrusting, multilaminar with zooids disposed irregularly forming circular domed patches (Fig. S8A). Zooids elongate (265-312-389 μm length [SD=43; N=16] x 204-236-288 μm width [SD=22; N=18]), suberect, frontal surface smooth with some large and rounded to elliptical areolar pores (Fig. S8A). Orifice almost circular, with wide sinus. A pair of avicularia latero-proximal to orifice located at the tip of an elevated column, directed forward and latero-proximally; rostrum serrate (61-76-97 μm length [SD=13; N=6] x 44-50-57 μm width [SD=4; N=12]), mandible semi-circular, crossbar complete (Fig. S8B, C). Interzooidal avicularia varying in size and quantities; elongate with rounded tip, slightly spatulate; rostrum elongate-rounded (209-245-310 μm length [SD=30; N=17] x 89-109-131 μm width [SD=12; N=20]), elevate from the surface, forming something like the cap in the end; palate elongate, mandible rounded at the end; crossbar complete (Fig. S8A, B).

Ovicell hyperstomial (97-146-192 μm length [SD=28; N=16] x 211-231-254 μm width [SD=12; N=16]), distal and with two rows of pores (Fig. 8D).

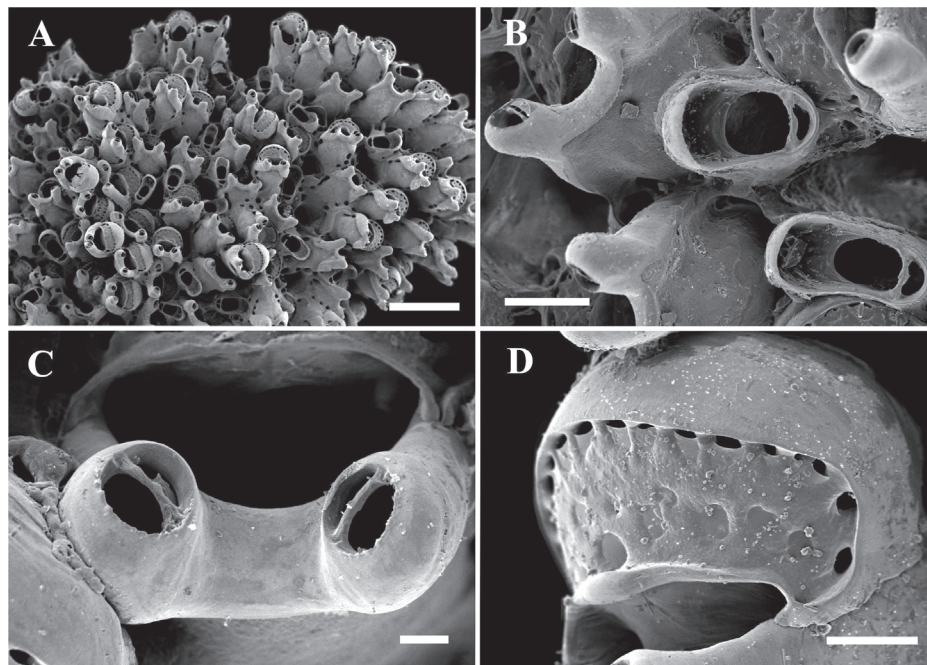


Fig. S8. *Celleporina mediterranea* Souto *et al.*, 2015. A. General view of the colony; B. Detailed view showing latero-proximal and interzooidal avicularia; C. Latero-proximal avicularia with serrated rostrum; D. Ovicell. Scale bars: 500 μm (A); 100 μm (B); 20 μm (C); 50 μm (D).

Ecology: Following Souto *et al.*, (2015) colonies can be found around 60 m depth at the Menorca Channel. After this publication, no records were mentioned in the literature until now.

Geographic distribution: Mediterranean Sea (Menorca Channel) and maybe at Marseille (France) (Souto *et al.*, 2015). This is the first record for Spanish waters and Alboran Sea.

Class Stenolaemata Borg, 1926
Order Cyclostomatida Busk, 1852
Family Tubuliporidae Johnston, 1837
***Tubulipora ziczac* Harmelin, 1976**

Tubulipora ziczac Harmelin, 1976: 166, Pl. XXVIII, fig. 1-7; Zabala & Maluquer, 1988: 176, fig. 582-584

Material examined: MNCN 25.02/250, Guadalemsí; one colony alive and fertile, used to SEM.

Short description: Colony small, adnate and lobate (Fig. S9A); peristome free, long (285-**478**-684 μm long [SD=141; N=14], measured from the base, x 97-**115**-133 μm in diameter [SD=11; N=20]) and staggered pattern but with some coalescing, radiating around of the lobe (Fig. S9A); surface striated and perforated by small and circular pseudopores (Fig. S9B, C). Basal portion forming a zigzag pattern and an internal concave half-moon partition at each corner of the zigzag. Gonozooids inflated, pyriform (exposed area: 480-**510**-540 μm long [SD=42; N=2] x 442-**471**-501 μm wide [SD=42; N=2]) not perforated by peristomes (Fig. S9A-C); ooeciostome terminal, simple, with a smaller diameter (44-**46**-48 μm diameter [SD=2; N=2]), in comparison to peristomes curved forward (Fig. S9B-D).

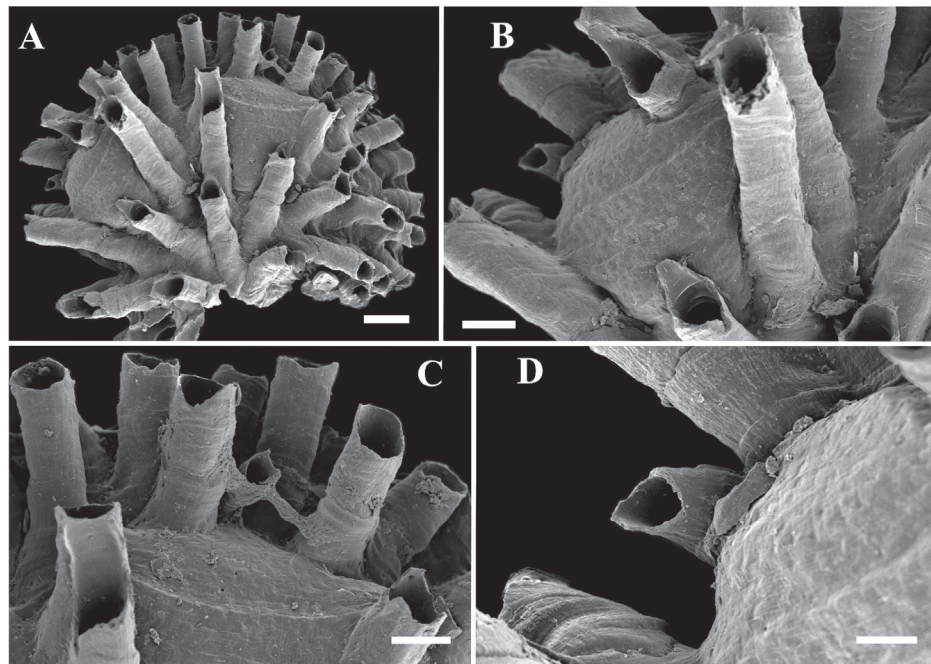


Fig. S9. *Tubulipora ziczac* Harmelin, 1976. A. General view of the colony with two gonozooids; B. Gonozooid with ooeciotube located on the right and behind; C. Second gonozooid with thin and curved ooeciotube; D. Detail of the ooeciotube. Scale bars: 200 μm (A); 100 μm (B, C); 50 μm (D).

Ecology: colonies can be found on rhizomes of *Posidonia*, coralligenous concretions (Harmelin, 1976).

Geographic distribution: Mediterranean Sea: Greek Sea, France, Spain (Cataluña) (Harmelin, 1976; Zabala & Maluquer, 1988; Gerovasileiou & Rosso, 2016). This is the first record for the Alboran Sea.

Family Annectocymidae Hayward & Ryland, 1985

***Annectocyma arcuata* (Harmelin, 1976)**

Diaperoecia arcuata Harmelin, 1976: 89, Pl. III, fig. 5-7, Pl. XIV, fig. 11.

Annectocyma arcuata, Zabala & Maluquer, 1988: 167; Hayward & McKinney, 2002: 107, fig. 51a-d.

Material examined: MNCN 25.02/251, Punta Carnero; one colony fertile used to SEM.

Short description: Colony initially creeping but become erect and strongly arched, like to a bridge. Peristomes open on the frontal side, disposed in quincuncial pattern (Fig. S10A); elongate variably (free parts: 451-**561**-703 μm length [SD=102; N=8]), aperture circular (138-**154**-173 μm diameter [SD=11; N=7]), surface striated and perforated by small and circular pseudopores (Fig. S10B). Gonozooid inflated, crossed by several peristomes, surface pointed by numerous, small and circular pseudopores (Fig. S10A, B); ooeciostome located more or less centrally, close to a peristome but not associated to it, compressed dorso-ventrally (126 μm length x 231 μm width; N=1) (Fig. S10B).

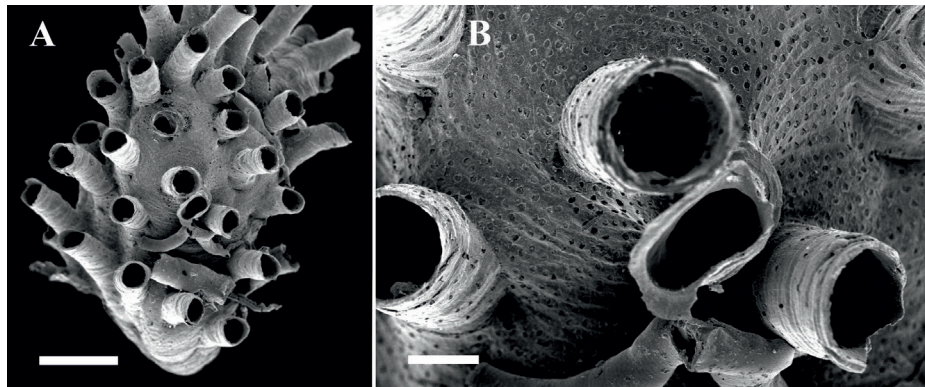


Fig. S10. *Annectocyma arcuata* (Harmelin, 1976) A. General view of a fertile colony; B. Detail showing ooeciostome. Scale bars: 500 μm (A); 100 μm (B).

Ecology: colonies found on mollusc shells (Hayward & McKinney, 2002).

Geographic distribution: Mediterranean Sea: Italy, Greek sea, France, Spain (Cataluña) (Zabala & Maluquer, 1988; Hayward & McKinney, 2002; Madurell *et al.*, 2013; Gerovasileiou & Rosso, 2016). This is the first record for the Alboran Sea.

Family Entalophoridae Reuss, 1869

***Mecynoecia delicatula* (Busk, 1875)**

Pustulopora delicatula Busk, 1875: 20.

Entalophora delicatula: Marcus, 1937: 24.

Mecynoecia delicatula: Harmelin, 1976: 160, Pl. XXVII, figs. 1-8; Buge, 1979: 221;

Mecynoecia cf. *delicatula* Ramalho *et al.*, 2009: 44, fig. 7a-f.

Material examined: MNCN 25.02/252, Ceuta; one colony alive and fertile, used to SEM.

Short description: Colony tubuliporiform (Fig. S11A); zooides open around the axis, peristome elongate variably (217-372-650 μm length [SD=131; N=8] x 101-121-140 μm width [SD=12; N=10]) and lightly curved (Fig. S11A, B). Internal wall with some peduncle spinules with thorny head. Gonozooid a simple elongate sac not pierced by the peristomes (Fig. S11A); oöciostome terminal central, associated with the proximal flank of a peristome (Fig. S11A, B); oöciotube proximal-distally compressed (66 μm length x 123 μm width; N=1) (Fig. S11B).

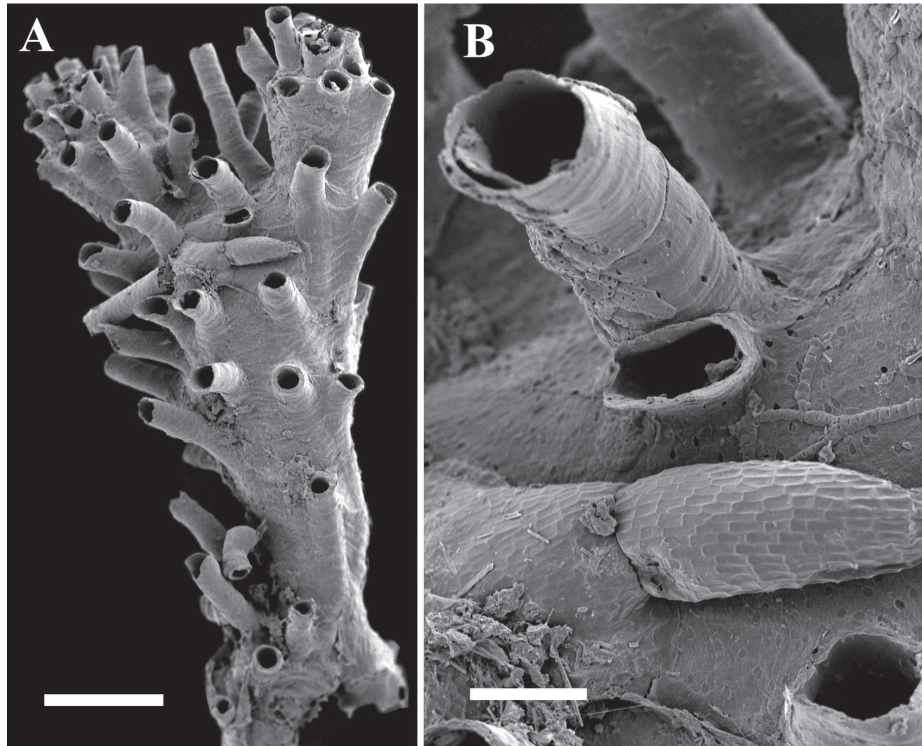


Fig. S11. *Mecynoecia delicatula* (Busk, 1875). A. General view of the colony; B. Detail showing the oöciotube associated with a peristome. Scale bars: 500 μm (A); 100 μm (B).

Ecology: Colonies recorded on leaves and rhizomes of *Posidonia oceanica* (Harmelin, 1976; Piazzì *et al.*, 2016), calcareous algae, sponge, bryozoans, shells and artificial substrates (Harmelin, 1976; Marcus, 1937; Ramalho *et al.*, 2009; Koçak *et al.*, 2014).

Geographic distribution: Mediterranean Sea: Spain (Cataluña), Aegean Sea (Greece), Turkey (Zabala & Maluquer, 1988; Koçak *et al.*, 2014; Gerovasileiou & Rosso, 2016; Piazzì *et al.*, 2016). Atlantic Ocean: Brazil (São Paulo, Rio de Janeiro), Gulf of Mexico (Marcus, 1937; Buge, 1979; Ramalho *et al.*, 2009). Indo-Pacific Ocean: East Africa, Japan and Australia (Marcus, 1937; Buge, 1979). This is the first record for the Alboran Sea.

Family Lichenoporidae Smitt, 1867

***Disporella hispida* (Fleming, 1828)**

Discopora hispida Fleming, 1828: 530.

Disporella hispida, Álvarez, 1987: 220; Zabala & Maluquer, 1988: 181, fig. 611-616, Pl. 34 c-d; Álvarez, 1992: 204, fig. 1-3; Hayward & McKinney, 2002: 123, figs. 60A-J, 61, 62A, B.

Material examined: MNCN 25.02/253, Bolonia: two colonies alive, no fertile; MNCN 25.02/254, Ceuta; one colony alive, used to SEM.

Short description: Colony encrusting, size and shape somewhat variable (0.3 to 1 cm diameter), with a narrow, calcified basal sheet (Fig. S12A). Peristomes short, disposed in quincunx or irregularly, aperture circular or oval ending in an unicuspidal apical region; alveoli circular to polygonal outline, smaller than autozooidal aperture, disposed among autozooids and at the colony centre (Fig. S12A-C). Several tine spines or granules on the internal wall of the peristome and alveoli (Fig. S12D). Gonozooid not observed.

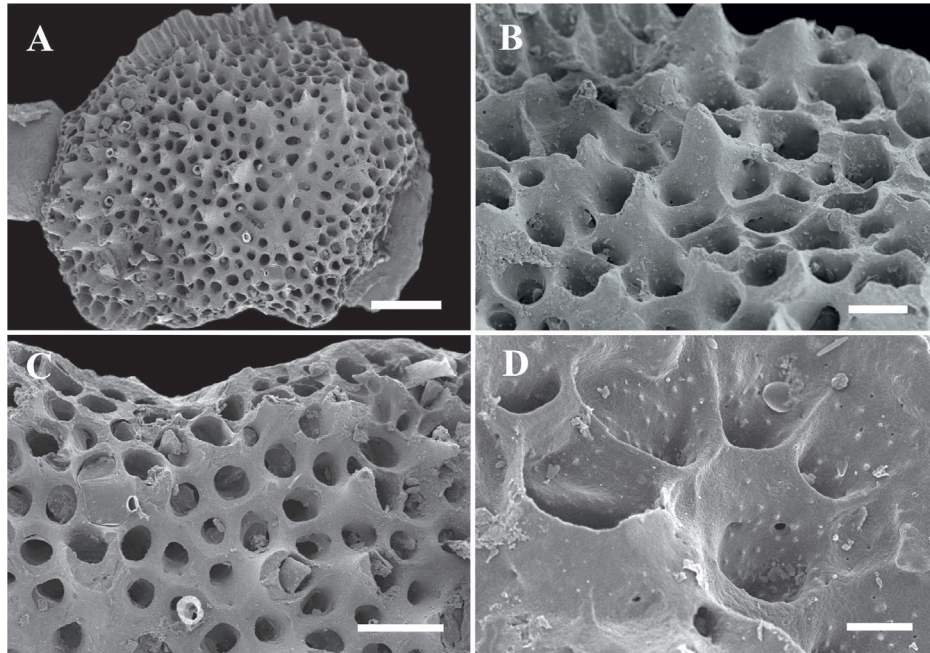


Fig. S12. *Disporella hispida* (Fleming, 1828). A. General view of the colony; B, C. Part of the colony showing peristomes and alveoli; D. Detail showing tine spines on the internal wall. Scale bars: 500 µm (A); 100 µm (B, C); 50 µm (D).

Ecology: Colonies recorded on algae, shells, ascidia, hydrozoans, decapods, stones from the shore to the edge of the continental platform (Hayward & Ryland, 1985, Álvarez, 1992; Koçak *et al.*, 2014)

Geographic distribution: Mediterranean Sea: Adriatic Sea, Turkey, Lebanon, Spain (Catalonia) (Zabala & Maluquer, 1988; Hayward & McKinney, 2002; Koçak *et al.*, 2014; Harmelin *et al.*, 2016). This is the first record for the Alboran Sea.

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