

***Bertorsonidra* n. gen. (Bryozoa, Cheilostomata) for *Tremopora prenanti* Gautier, 1955, a rare species from the Mediterranean**

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ABSTRACT

The genus *Bertorsonidra* n. gen. is here proposed for *Tremopora prenanti* Gautier, 1955, a cheilostome bryozoan species from the Mediterranean area. The new description and first SEM illustration is mostly based on living material collected from infralittoral (17-19 m) bottoms off W Sicily and fossil specimens from lower Pleistocene, and possibly Pliocene, associations from three different localities in Sicily. The genus and species are characterized by a pseudoporous lepraliomorph frontal shield bordered by marginal areolae, with a prominent suboral umbo; a subcircular primary orifice with a shallow large sinus flanked by condyles, usually protected by oral spines; a prominent ovicell with an entirely exposed calcified entoecium sculptured by tubercles and pseudopores; a lateral suboral, hooked avicularium; and basal calcified pillar-like prominences for adhering to the substratum. The affinities of the genus with *Robertsonidra* Osburn, 1952, characterized by a frontal shield only perforated by peripheral areolae, are discussed. The erection of the new family Robertsonidridae n. fam. within the Lepraliomorpha is suggested for accommodating both *Robertsonidra* and *Bertorsonidra* n. gen. Information is given about ecological requirements of the species, persisting during time, and its morphological adaptation for colonising algal substrata, which *Bertorsonidra prenanti* n. comb. shares with some species of the genus *Robertsonidra* and other ones belonging to systematically unrelated genera.

KEY WORDS

Bryozoa,
Cheilostomata,
Recent,
Pliocene-Pleistocene,
ecological distribution,
functional morphology,
new family,
new genus.

RÉSUMÉ

Bertorsonidra n. gen. (Bryozoa, Cheilostomata) pour *Tremopora prenanti* Gautier, 1955, une espèce rare de la Mer Méditerranée.

Le nouveau genre *Bertorsonidra* n. gen. est proposé pour *Tremopora prenanti* Gautier, 1955, une espèce méditerranéenne de Bryozoaire Cheilostome. La nouvelle description et les premières illustrations réalisées sur cette espèce au microscope électronique à balayage sont essentiellement fondées sur des spécimens vivants recueillis sur des fonds infralittoraux de la Sicile occidentale, mais aussi sur des exemplaires fossiles du Pléistocène inférieur et peut-être du Pliocène, provenant de plusieurs localités de Sicile. Le genre et l'espèce sont caractérisés par une frontale autozoïdale lepraliomorphe percée par des pseudopores et des pores périphériques avec un umbo suboral saillant; un orifice primaire subcirculaire avec un sinus large et peu profond délimité par des condyles et protégé habituellement par des épines; une ovicelle saillante avec un entocium calcifié complètement exposé, orné de tubercules et des pseudopores; un aviculaire suboral latéral crochu; et par des piliers basaux calcifiés creux permettant l'adhérence au substrat. Les affinités du nouveau genre avec *Robertsonidra* Osburn, 1952, caractérisé par une frontale autozoïdale exclusivement percée d'aréoles périphériques, sont discutés. Les auteurs suggèrent la création d'une nouvelle famille Robertsonidridae n. fam., située au sein des Lepraliomorpha, pour accueillir les deux genres *Robertsonidra* et *Bertorsonidra* n. gen. Des informations sont apportées sur l'écologie de l'espèce, stable dans le temps, et ses adaptations morphologiques pour la colonisation des substrats algaux, adaptations que *Bertorsonidra prenanti* n. comb. partage avec des espèces de *Robertsonidra* et d'autres, dont la position systématique est éloignée.

MOTS CLÉS

Bryozoaires,
Cheilostomata,
actuel,
Pliocène-Pléistocène,
distribution écologique,
morphologie
fonctionnelle,
famille nouvelle,
genre nouveau.

INTRODUCTION

During the examination of samples recently collected from shallow shelf areas west of Sicily in the Mediterranean, some bryozoan colonies were identified as conspecific with a few fossil ones from upper Neogene layers cropping out in Sicily and belonging to "*Tremopora*" *prenanti* Gautier, 1955. This species was erected by Gautier for specimens from off Algeria, but it has actually never been found thereafter, although it was subsequently recorded as *Rhambostomella argentea* (Hincks, 1881) in some comprehensive lists of bryozoans from the Mediterranean (Gautier 1962; Zabala 1986) and recently as *Rhambostomella* (?) *prenanti* by d'Hondt & Ben Ismail (2008).

Analysis of the new material allowed the Mediterranean specimens to be removed from synonymy with the Indo-Pacific *R. argentea*, confirming the validity of the species described by Gautier (1955)

in agreement with d'Hondt & Ben Ismail (2008). Furthermore, the lepraliomorph frontal shield also prohibits an attribution of these specimens to neither the malacostegan genus *Tremopora* Ortmann, 1890 nor the umbonulomorph genus *Rhambostomella* von Lorenz, 1886. Finally, even the genus *Robertsonidra* Osburn, 1952, in which *R. argentea* and several similar species were recently placed (Ryland & Hayward 1992; Tilbrook 2006), differs significantly in characters of the zooecial and ooeical walls.

In this paper "*T.*" *prenanti* is re-described after SEM analysis, a new genus is introduced to accommodate the species, and its systematic position within a new family is discussed.

MATERIALS AND METHODS

The studied material originates from two different sources. Fossil colonies were sampled in three different

localities, all from Sicily (Fig. 1). Two specimens, from lower Pleistocene sediments, were found at Pianometa (central-eastern Sicily) and Case Catarinichia (western Sicily) sections, which are described in Pedley *et al.* (2001) and Di Geronimo *et al.* (1994), respectively. A further specimen originates from Plio-Pleistocene layers cropping out in the Barcellona-Pozzo di Gotto Basin, in north-eastern Sicily (Messina 2003). The few available living specimens come from two sampling stations in the Egadi Archipelago, off western Sicily. The material was collected within a CoNISMa project for the assessment of habitat and species biodiversity in four Italian Marine Protected Areas (4AMP) in October 2007.

Measurements (in μm) were taken with a Zeiss Stereodiscovery V8 system equipped with AxioCam MRC and Axiovision acquisition system. The cleaned but uncoated material was examined in low vacuum conditions with a Tescan Vega 2 LMU Scanning Electron Microscope (SEM).

Type material is housed at the Muséum national d'Histoire naturelle, Paris (MNHN), whereas newly collected specimens of the same species are stored at the Paleontological Museum of Catania University (PMC). Further examined material is in the Natural History Museum, London (BMNH).

Bryozoan systematics follows d'Hondt (2001) partly revised after the working classification proposed by D. P. Gordon (pers. comm. 2007) for the eventual use in the *Treatise of Invertebrate Paleontology*.

SYSTEMATICS

Suborder ASCOPHORINA Levinsen, 1909
 Infraorder LEPRALIOMORPHA Gordon, 1989

Family ROBERTSONIDRIDAE Rosso, n. fam.

DIAGNOSIS. — As for the genus (see below), but frontal wall including a pseudoporous or a centrally imperforate area, besides the row of marginal areolae.

Genus *Bertorsonidra* Rosso, n. gen.

DIAGNOSIS. — Colony encrusting attached to the substratum through pillar-like structures emanating from the basal surface. Autozooids loosely arranged and

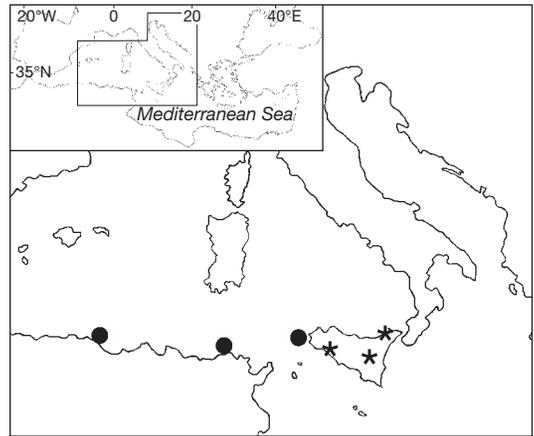


FIG. 1. — Geographical distribution of *Bertorsonidra prenanti* (Gautier, 1955) n. comb.: ●, living populations; *, fossil populations.

leaving interzooidal spaces. Frontal wall pseudoporous bordered by marginal pores. Orifice semicircular with a proximal sinus and lateral condyles. Peristome inconspicuous. Spines present, not articulated at the base, two persisting in ovicellate zooids. Suboral umbo sporadic but characteristic. Avicularia present, typically single, lateral-suboral on an inflated cystid. Ovicell prominent with uncalcified ectooecium and a granular, evenly pseudoporous entoecium. Interzooidal communication through uniporous septulae arranged in a band in the vertical walls.

TYPE SPECIES. — *Tremopora prenanti* Gautier, 1955 by present designation.

ETYMOLOGY. — The name is an anagram of *Robertsonidra*, a closely related genus.

Bertorsonidra prenanti (Gautier, 1955) n. comb.
 (Figs 2; 3; 4A)

Tremopora prenanti Gautier, 1955: 236, pl.1, figs 6-8.

Rhamplostomella argentea – Gautier 1962: 160. — ?Zabala 1986: 438. — ?Zabala & Maluquer 1988: 124, fig. 275.

Non *Schizoporella argentea* Hincks, 1881: 158, pl. 9, fig. 6a, b.

Non *Robertsonidra argentea* – Ryland & Hayward 1992: 261, fig. 19b. — Tilbrook 2006: 261, pl. 57E, F.

Hippoporina sp. – Di Geronimo *et al.* 1994: 102, part.

Rhaphostomella (?) *prenanti* – d'Hondt & Ben Ismail 2008: 63.

MATERIAL EXAMINED. — **Algeria.** Castiglione, 22.IV.1952, unique colony, holotype (MNHN, J. Picard collection).

Western Sicily. Egadi Islands, Marettimo Island, South of Bassana Point, sample EBE.4, 19 m depth, 4 fragments, seemingly from a single, living, fertile colony (PMC. R. I. H. B9a). — Egadi Islands, north of the Levanzo Island, off Cape Grosso, samples ELE.7 and ELI.7, respectively sampled during summer and winter seasons, 17 m depth, 5 fertile and sterile fragments (PMC. R. I. H. B9a).

Case Catarinicchia section, early Pleistocene, sample BC7, 1 specimen (PMC. R.I.Ps. B9a).

Central-eastern Sicily. Basal bioclastic layer of the Pianometa section, early Pleistocene, 1 fertile specimen (PMC. R.I.Ps. B9b).

North-eastern Sicily. East of Furnari, Contrada Inferno, Barcellona Pozzo di Gotto Basin, middle-late Pliocene or ?early Pleistocene, sample MC.116, 1 specimen (PMC. R.I. B9c).

DESCRIPTION

Colony encrusting multiserial and unilaminar, orange to salmon in colour, loosely attached to the substratum and elevated from it through regularly spaced, mineralised, short, hollow, pillar-like structures emanating from the basal surfaces, mostly from the periphery, of each zooid (Fig. 2D).

Autozooids oval to rhomboidal, slightly convex, separated by distinct grooves and a thin raised suture, usually leaving irregularly-shaped lacunae where three zooids come into contact (Fig. 2A, F). Frontal wall coarsely tuberculate with a peripheral row of relatively large, elongated pores plus 18–28 rounded infundibular ones, scattered on the frontal surface (Fig. 2A, B). Orifice located very distally, slightly wider than long with a semicircular distal rim, lined by a thin distal shelf, and a straight proximal lip; sinus very shallow and wide, occupying more than half of the proximal edge, flanked by squared and shallow slightly denticulate condyles (Figs 2B, C, E; 3D). A thin peristome sometimes develops, raised on the anter, shallowing laterally to level orifice at proximal corners. One to three, usually two, inconspicuous slender spines, not articulated at the base, characteristically very distal at each side, or asymmetrical (Figs 2A–E; 3A, B, D), two persisting in ovicellate zooids, usually

slightly displaced proximally (Figs 2E, F, H; 3C). An elevated, pointed, slightly asymmetrical umbo present on most autozooids (mostly obvious in Fig. 2C, H); its surface evenly tuberculate, except for the truncated, smooth, distal side.

Avicularium single, often lacking, lateral-suboral on an inflated imperforate cystid; rostrum acute to the frontal surface and laterally directed, typically elongate triangular with a hooked tip; cross-bar complete, strong and slightly arched (Figs 2B, E; 3A–C, F, G). Paired avicularia observed in a single zooid (Fig. 2G).

Ovicell globular, prominent, recumbent on and slightly immersed in the frontal wall of the distal zooid, slightly wider than long and restricted near the opening, overarching the zooidal primary orifice (Figs 2E, F, H; 3C), seemingly semicleithral or cleithral *sensu* Ostrovsky (2008). It has an entirely membranous ectooecium and a calcified entoecium sculptured by evenly distributed small pseudopores located within depressions in between smooth truncated tubercles; the proximal margin lined by a thin slightly raised edge (Figs 2F; 3C).

Communication of contiguous zooids through 12–20 pores irregularly arranged in longitudinal band just below the midline of the vertical walls between adjacent zooids (Fig. 2D).

Ancestrula not observed.

Measurements

Zooidal length: 637 ± 66 (549; 858) $n = 34$; zooidal width: 412 ± 57 (315; 582) $n = 34$; orifice length: 124 ± 8 (108; 139) $n = 34$; orifice width: 152 ± 12 (128; 179) $n = 34$; ovicell length: 308 ± 44 (246; 368) $n = 9$; ovicell width: 379 ± 18 (363; 408) $n = 9$; avicularial length: 158 ± 20 (117; 183) $n = 11$; avicularial width: 90 ± 15 (63; 109) $n = 11$.

VARIABILITY

The above description is exclusively based on living specimens. Several skeletal characters contribute to the intraspecific variability: the size of zooids and the zooidal outline and morphology, including calcification of the frontal wall and sculpture development; the presence and strength of the suboral umbo; the size and proportions of orifices; the number of oral spines (up to 4 in few zooids and

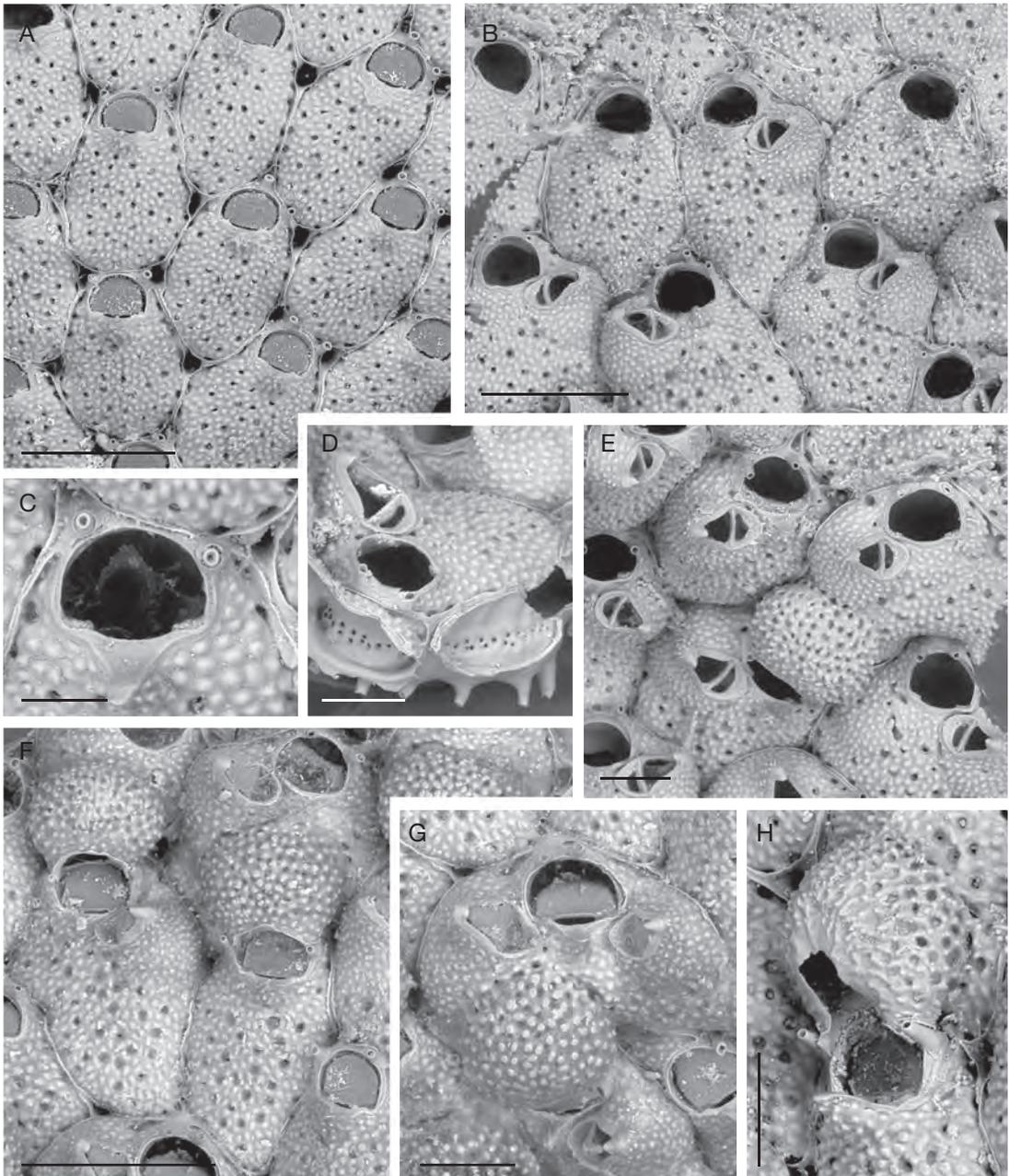


FIG. 2. — *Bertorsonidra prenanti* (Gautier, 1955) n. comb., living specimens from the Egadi Islands (Western Sicily): **A, F-H**, sample ELE.7, 17 m depth, Cape Grosso, North of the Levanzo Island; **B-E**, sample EBE.4, 19 m, South of Bassana Point, Marettimo Island (PMC R. I. H. B9a); **A**, untreated sterile zooids lacking avicularia seemingly from near the periancestrular area, large interzooidal lacunae are obvious and two often asymmetrical spines are present distal to each orifice; **B**, sterile zooids mostly with an avicularium lateroproximally located to the orifice, note the variability in the number of orificial spines; **C**, primary orifice; **D**, communication pores in lateral walls of broken zooids, and pillar-like rhizoidal projections emanating from the basal surface; **E**, some zooids with an ovicell; **F**, uncleaned ovicellate zooids, note the persistence of the two slender spines; **G**, the only observed zooid with twin avicularia; **H**, distal part of a zooid with its protruding suboral umbo and an incompletely formed ovicell. Scale bars: A, B, E, 500 μ m; C, 100 μ m; D, F-H, 200 μ m.

5 in a single one on the type material) and, most obviously, the presence or absence of avicularia in large parts of the colony.

Differences in skeletal preservation caused by biostratinomic mechanical stresses and by partial dissolution and extensive re-crystallization during fossilization often hamper the reliable attribution of fossil specimens to species-level taxa, as recently remarked by Berning (2006). Nevertheless, in the fossil specimens of *R. prenanti*, the well-preserved distinctive frontal wall morphology, together with the partial or complete preservation of orificial spines and even of condyles (usually absent from most zooids, seemingly due to their thinness and/or a different mineralogical composition) on at least single zooids in a colony, allow for an identification to species level. Representatives of the fossil populations appear very close to the living ones. Only few differences between the fossil and the Recent specimens have been detected, which have been considered as intraspecific variability. They include the slightly distal position of the lateral-suboral avicularia, which are laterally or slightly disto-laterally directed; and the relatively depressed ovicells, being less distinct from the distal zooid frontal wall (seemingly due to secondary calcification), tending to form a more V-shaped proximal border.

Interestingly, fossil specimens from Pianometa exhibit some ovicells, which have prominences in their central part, thus being somewhat reminiscent of the tuberculate ovicells of "*Ramphostomella argentea*", as figured by Zabala & Maluquer (1988). Nevertheless, and apart from this character, both diagnosis and drawing of Zabala & Maluquer (1988: 123, fig. 275), are probably a conflation.

REMARKS

The species was formerly erected by Gautier (1955) as *Tremopora prenanti* although subsequently synonymised by the same author (Gautier 1962: 261) with *Schizoporella argentea* Hincks, 1881 from the Indo-Pacific, following personal suggestions by M. Prenant and A. B. Hastings. Nevertheless, the Mediterranean species is only reminiscent of *Robertsonidra argentea* as described and figured by Ryland & Hayward (1992: 261, fig. 19b) and by

Tilbrook (2006: 261, pl. 57E, F). In fact, *Bertorsonidra prenanti* n. comb., exhibiting a wide shallow sinus laterally marked by squared condyles, clearly differs from *R. argentea*, which is characterized by a primary orifice with a deep concave sinus not flanked by condyles. Furthermore, *R. argentea* shows two different kinds of lateral-suboral avicularia: 1) a smaller and relatively more common one opposite to the umbo, acute to the frontal plane, distally hooked and laterally directed; and 2) a larger and rarer but more diagnostic one, normal to the frontal plane and proximolaterally directed. In contrast, a single avicularium type seems to be present in the Mediterranean species: lateral suboral, laterally directed, with a hooked rostrum on a large and prominent cystid. Further differences include the colour of living tissue (yellowish-white in *R. argentea*), the zooidal outline, and the number, extent and morphology of the marginal pores. But most important differences relate to the presence of an evenly porous zooidal frontal wall in *B. prenanti* n. comb. (see discussion below).

Bertorsonidra prenanti n. comb. also differs from "*R. argentea*" recorded by Powell (1967: 169, pl. 2, fig. 10) from the Red Sea, which have rare obliquely and proximally directed large avicularia, and is actually a different further species, as suggested by Tilbrook (2006). Moreover, photo observation of the specimen labelled as *Robertsonidra argentea* from an unknown Mediterranean locality in the Busk collection (BMNH 1963:4.18.33) but different from this species (see discussion in Tilbrook 2006: 262), proved that it is not even conspecific with *B. prenanti* n. comb. More detailed analyses are needed for its determination.

Bertorsonidra prenanti n. comb. seems also different from *R. oligopus* (Robertson, 1908), the type species of *Robertsonidra*, also synonymised with *R. argentea* by Gautier (1962). *Robertsonidra oligopus*, seemingly restricted to the west coast of North America, is characterized by a convex frontal wall with a suboral, medially-placed prominent umbo, a lateral oral avicularium usually distal-laterally directed, and an ovicell with a crenate margin (Robertson 1908: 292, pl. 20, figs 50-52). Unfortunately, the primary orifice was not described in detail and drawings, including opercula, only allow to appreci-

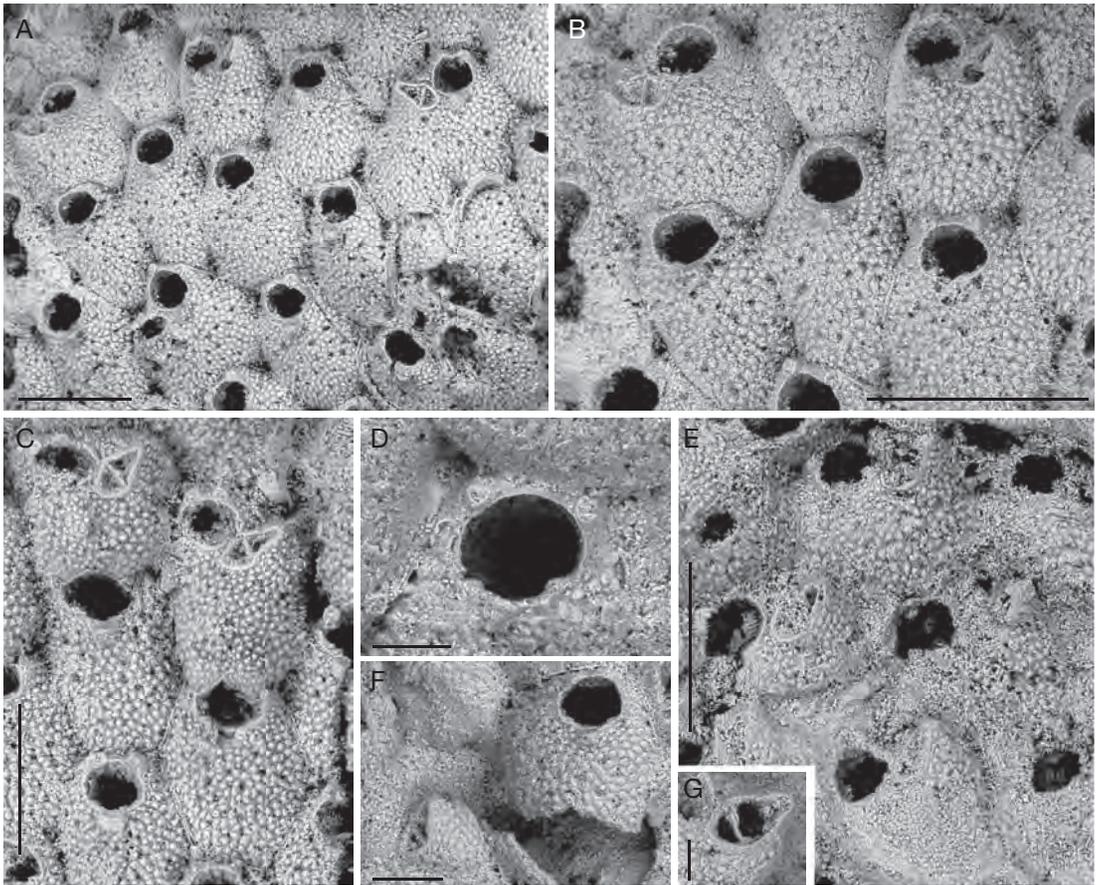


FIG. 3. — *Bertorsonidra prenanti* (Gautier, 1955) n. comb., fossil specimens from Sicily: **A-D**, early Pleistocene from the Pianometa section, central-eastern Sicily (PMC. R.I.Ps. B 9b); **E-G**, late Pliocene or early Pleistocene from Contrada Inferno, East of Furnari, NE Sicily (PMC. R.I. B 9c); **A**, sterile zooids, some with avicularia; **B**, detail of **A**; **C**, ovicellate zooids; **D**, well-preserved primary orifice with condyles and two oral spines; **E**, a few zooids, the sculpture of the frontal surface locally masked by dissolution at contact with overgrowing algae; **F**, a proximally broken zooid with intact orifice; **G**, close-up of an avicularium. Scale bars: A-C, E, F, 500 µm; D, G, 100 µm.

ate orifices, which are dimorphic in ovicellate and non-ovicellate zooids, both with a shallow sinus and, noticeably, the absence of oral spines.

The attribution of *B. prenanti* n. comb. to the genus *Ramphostomella*, as suggested by Gautier (1962) and dubitatively by d'Hondt & Ben Ismail (2008) after examination of the unique known specimen from Algeria, is precluded. The genus *Ramphostomella*, in fact, possesses a centrally imperforate, umbonulomorph frontal shield and pronounced ridges between marginal areolae, markedly different orifice and ovicell (see Gordon & Grischenko 1994). In contrast,

a strikingly similar morphological appearance and several characters are actually shared with species of the genus *Robertsonidra* Osburn, 1952, except for the pseudoporous lepraliomorph frontal wall, that is not the case for *Robertsonidra*. Consequently, as none of the already established genera seems to share all the morphological features observed in the examined material *Bertorsonidra* n. gen. is here proposed to accommodate the species described by Gautier. Particularly, the presence of pores in the frontal wall has been considered enough for erecting the new genus, somewhat paralleling the

criteria adopted for separating couples of confamilial genera, such as the couple formed by *Therenia* David & Pouyet, 1978 and *Herentia* Gray, 1848 within the Escharinidae Tilbrook, 2006 (see Berning *et al.* 2008), and that formed by *Buffonellaria* Canù & Bassler, 1917 and *Pourtalesella* Winston, 2005 within the Celleporidae Johnston, 1838 (see Winston 2005, but also Berning & Kuklinsky 2008). Consequently, it could be suggested that also *Robertsonidra* and *Bertorsonidra* n. gen., sharing most of their characters and differing for the nature of their frontal walls belong to the same family. Nevertheless, as the genus *Robertsonidra*, including at least seven species, mostly from the Indo-Pacific area (Bock 2002, but see above), had remained systematically unplaced (see Tilbrook 2006: 261), the erection of a new family Robertsonidridae n. fam. is here suggested for accommodating both *Robertsonidra* and *Bertorsonidra* n. gen. The new family shares some features, such as the concave to widely sinuate primary orifice and the frontal avicularia, with the Bitectiporidae MacGillivray, 1895 (as reported by Hayward & Ryland 1999 and Ramalho *et al.* 2008) but differs for the ovicells with calcified entoecium and ectoecium, which remain unfused. In contrast, although special studies aimed to describe ovicells in both genera are needed, both *Robertsonidra* and *Bertorsonidra* n. gen. seem to possess ovicells with an entirely uncalcified ectoecium and appear consequently comparable to those in the family Schizoporellidae Levinsen, 1909, mostly those of species belonging to the genus *Schizoporella* Hincks, 1877.

FUNCTIONAL MORPHOLOGY

Colonies of *B. prenanti* n. comb. are loosely attached to their substratum through hollow, pillar-like structures (Figs 3D; 4A), already described and figured by Gautier (1955: figs 7, 8), which emanate from the basal surfaces of each zooid. These structures, mostly originating from the zooid periphery, elevate the basal surface of the colony some tens of micrometers above the substratum leaving a fissure-space above the algal tissue. Furthermore, it has been observed that the length of the rhizoidal pillars changes seemingly to better adapt the relatively thick and large colonial modules (zooids can reach about 900 µm

in length and 600 µm in width: see measurements) to the curving or irregularly uneven morphology of the colonised surfaces. Finally, zooids are loosely connected each other and more or less wide lacunae exist in between them. All these features allow a certain articulation or at least some constructional flexibility to be attained. Consequently, colonies are able to grow nearly flat, thus partly levelling the irregularities of the colonised surfaces, when encrusting rough substrata, and to cover surfaces which are flexible or fleshy for the presence of soft tissues possibly without being particularly dangerous or lethal for the overgrown organism, due to their loose attachment. The presence of basal pillar-like attachment structures is not exclusive of *B. prenanti* n. comb. but has been observed also in similar, possibly related species, such as those belonging to *Robertsonidra* (see Robertson 1908; Tilbrook 2006). Furthermore, comparable basal extensions are present in species of the Hiantoporidae *Hiantopora* and the Microporidae *Mollia* (Fig. 4B, AR pers. obs.), as already observed by Gautier (1955) himself and Berning (2006).

DISTRIBUTION

Bertorsonidra prenanti n. comb. is presently known only from a restricted area in the present-day and past Mediterranean. Living specimens originate from the southern part of the western Mediterranean: the colonies described by Gautier (1955, 1962) and recently listed by d'Hondt & Ben Ismail (2008) were sampled at Castiglione (Algeria), and those herein described come from the Egadi Islands located West of Sicily. Additional material is from off Tabarka, western Tunisia (Harmelin, pers. comm., December 2008). Noteworthy, the species is apparently absent from the eastern side of Sicily (Ionian Sea), which was extensively examined for bryozoans (Rosso 1996a, b; Rosso *et al.* 2008, 2010 and pers. obs.) and other western Mediterranean localities (see Gautier 1962; Harmelin 1976), as also discussed by Zabala (1986) and Zabala & Maluquer (1988). Similarly, no bryozoan review from the Adriatic (Novosel & Požar-Domac 2001; Hayward & McKinney 2002) and the Aegean Sea (Harmelin 1968, 1969; Hayward 1974) reported this species. Furthermore, all available fossil specimens come from Sicily.

The Egadi specimens were found detached from their substrata or attached to coralline and peyssonneliacean algae, except for a single colony fragment encrusting a sponge. Material invariably originated from (pre)coralligenous bottoms, ranging from 17 to 19 m in depth. This environment is characterized by the abundance of algae, mostly encrusting corallinales, peyssonneliaceans, the chlorophyceans *Halimeda tuna* (J.Ellis & Sol.) J.V.Lamour. and *Flabellia petiolata* (Turra) Nizam., the scleractinians *Leptosammia prouvoti* Lacaze-Duthiers, 1897 and *Astroides calycularis* (Pallas, 1766) and gorgonaceans, among which *Eunicella cavolini* (van Koch, 1887). Bryozoans are abundant and diversified including ubiquitous and typical coralligenous species such as *Scrupocellaria delilii* (Audouin, 1826), *Beania* spp., *Pentapora ottomuelleriana* (Moll, 1803), *Margaretta cereoides* (Ellis & Solander, 1786), *Rhynchozoon neapolitanum* Gautier, 1962, and locally, *Adeonella calveti* Canù & Bassler, 1930, *Myriapora truncata* (Pallas, 1766) and *Reteporella grimaldi* (Jullien, 1903). Colonies of *B. prenanti* n. comb. from Algeria, sampled from between 30 and 40 m, encrusted nodular calcareous algae (Gautier 1955, 1962).

Noteworthy, the same kind of substratum was utilised by the three specimens of *B. prenanti* n. comb. found in fossil assemblages, which can be interpreted as living in a depth range deeper than 10-15 m and shallower than about 40 m. Particularly, the Pianometa colony was one of the extremely rare bryozoans from bioclastic cobblestones rich in centimetre- to decimetre-sized rhodoliths, and encrusted a coralline alga. Rhodoliths, whose nuclei consist of large fragments of the scleractinian *Cladocora caespitosa* (Linnaeus, 1767), were deposited in pyroclastite layers in very shallow waters (Pedley *et al.* 2001; AR pers. obs.). Similarly, the colony from Contrada Inferno along the Mazzarrà stream from NE Sicily, was found on a sub-spherical rhodolith sampled in a polymictic conglomerate layer, including pebbles and cobbles, sometimes coated by algae and rarely colonised by bryozoans (AR pers. obs.). Finally, the colony from the Belice section comes from silty-sandy layers, relatively rich in bioclasts, small rhodoliths and algal coatings on large mollusc shells, interpreted as derived from a Coastal

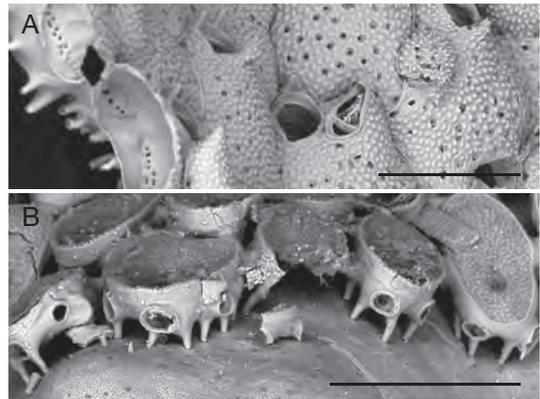


FIG. 4. — Attaching structures: **A**, broken colony of *Bertorsonidra prenanti* (Gautier, 1955) n. comb. showing pillar-like structures emanating from the zooid basal walls; **B**, margin of a *Mollia patellaria* (Moll, 1803) colony adhering to the surface of a coralline alga through long pillar-like structures. Scale bars: 500 μ m.

Detritic Biocoenosis (*sensu* Pérès & Picard 1964) developed at about 40 m depth. Bryozoans include dominant *Cellaria* spp. internodes, together with *Reteporella couchii* (Hincks, 1878), *Smittina cervicornis* (Pallas, 1766), *Pentapora fascialis* (Pallas, 1766), *Entalophoroecia deflexa* (Couch, 1844), *Platonea stoechas* Harmelin, 1976 and *Buskea nitida* (Heller, 1867). Some other species, such as lichenoporidae, *Copidozoum planum* (Hincks, 1880), *C. tenuirostre* (Hincks, 1880) and *Micropora coriacea* (Johnston, 1847) were found, also encrusting coralline algae (Di Geronimo *et al.* 1994).

From the above reported data, it follows that *B. prenanti* n. comb. seems to have a restricted geographic range and that it is extremely rare both in the geological past and nowadays. Interestingly, the species has maintained sensibly unaltered its ecological requirements through time, being selective of the Coralligenous Biocoenosis *sensu* Pérès & Picard (1964), although seemingly not excluded from other biocoenoses. Such a feature makes this species an useful tool for palaeoecological inferences.

The stratigraphic range of *B. prenanti* n. comb. includes at least the middle part of the Early Pleistocene, as the Pianometa and the Belice layers were presumably deposited during the Emilian (Pedley *et al.* 2001) and the Sicilian (see Sprovieri & Cusenza 1972; Di Geronimo *et al.* 1994), respectively.

Nevertheless, it could not be excluded that the species appeared earlier than this. The *B. prenanti* n. comb. bearing layers from the Contrada Inferno have not been dated due to the absence of stratigraphic markers, but sedimentation in the area (Barcellona Pozzo di Gotto Basin) became in the Early Pleistocene and locally date back since the Middle-Late Pliocene (Messina 2003).

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