

## MELICERITA DIGERONIMOI SP. NOV.: A NEW ANTARCTIC BRYOZOAN

*Melicerita digeronimoi* sp. nov.: un nuevo briozoo antártico

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### ABSTRACT

*Melicerita digeronimoi* sp. nov. sampled during the First Italian Oceanographic Expedition (1987-88) in the Ross Sea (Antarctica) is here described. Some accounts about the Recent *Melicerita* species, all distributed in the southern hemisphere, and dichotomic keys for their determination are given.

KEYWORDS: Bryozoa. Cellariidae. *Melicerita*. New species. Antarctica.

### INTRODUCTION

During the First Italian Oceanographic Antarctic Expedition, carried out in the 1987-88 austral summer, several stations were sampled both inside the Terra Nova Bay, near the Italian Base and offshore, in the Ross Sea. A large number of these samples contain an abundant and diversified Bryozoan fauna, only partially analyzed till now (Rosso, 1990; 1992).

The systematic study, in particular, was initially begun with some families of the Anascina suborder among which the Family Cellariidae Hincks, which comprise 9 species pertaining to the following genera: *Cellaria*, *Cellariaeforma*,

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### RESUMEN

Se describe *Melicerita digeronimoi* sp. nov. recolectada durante la primera Expedición Oceanográfica Italiana al Mar de Ross (Antártica). Se discuten las especies recientes del género *Melicerita*, todas del hemisferio sur, y se dan claves para su determinación.

*Paracellaria*, *Larvapor*a, *Swanomia* and *Melicerita* (Rosso, in prep.). This last genus seems to be the most diversified comprising, besides the two already known Antarctic species *Melicerita latilaminata* and *Melicerita obliqua* (both living in the same station: IB3; 220 metres depth), also a single specimen pertaining to a new species, described below.

### MATERIALS

A single, incomplete colony 12 millimetres long and 1.5 millimetres wide was analysed from the Station ID16, at a depth of 681 metres, in the Ross Sea, off the Terra Nova Bay (74° 48.20' S and 167° 17.30' E).

The sample, made using a "naturalist type dredge", consisted of a greenish mud containing a lot of agglutinant forams, mollusks (*Bivalvia* and *Scaphopoda* essentially), ophiuroids, pycnogonids and echinoids of the *Spatangoida* group (Di Geronimo & Rosso, 1990). Other Bryozoans are absent.

### DESCRIPTION

Familia CELLARIIDAE Hincks, 1880

Genus *Melicerita* Milne-Edwards, 1836

Species *Melicerita digeronimoi* sp. nov.

Pl. I. Figs. 1-6

Erect, calcareous colony, unarticulated, nodulate, bilaminar, flattened, slightly curved in a sabre shape, with a lengthwise ridge along the two lateral margins, anchored to the substratum by means of chitinous rootlets.

Autozooids regularly hexagonal, as long as wide, with raised (lengthwise straight, proximally concave and distally convex) edges (Plate I; Fig. 1), arranged in alternate transverse rows, each made up of 2-3 zooids and terminating, on the convex margin of the colony, either an avicularium or an autozooid which alternate. Cryptocyst finely granular, strongly sloping near the edges but rather flat centrally, marked by two uniformly raised longitudinal ridges developing for nearly the entire length of the autozooids, between the opesium and its lateral edges (Plate I, Figs. 1, 4, 6). Aperture in the distal third of the autozooid, near the distal end (Plate I, Figs. 1, 4, 6), semicircular with an arched distal border and a straight proximal one, extending in a very large and flat rectangular process, slightly crenellate, process leaving two marked lateral indentations (Plate I, Figs. 3, 4, 6). The lateral ends of this process seem to be folded inside to form two acuminate, slightly diverging condyles (Plate I, Figs. 4, 6). Opesial rim thin and slightly raised and crenellate (Plate I, Fig. 6).

Ovicell endothoical, completely immersed, indicated outside by a semi circular oeciopore (1/3 width of the opesium) situated along the distal end of the zooid, and by two latero-proxi-

mal, symmetrical, subelliptical, crenellate pores (Plate I, Figs. 1-3). Only in later ontogeny the ovicell become evident as a slight, moderate swelling of the proximal part of the distal row of zooids (Plate I, Fig. 2).

Vicarious avicularia, roughly as large as 1/2 autozooid, irregularly quadrangular, exclusively located along the convex margin of the colony, in alternate rows on each side of the lateral ridge (Plate I, Figs. 1, 4). Cryptocyst finely granular, depressed, with a subcentral opesium, proximally marked by a semi-circular or semi-elliptical, sometimes very oblong, ridge (Plate I, Fig. 5). Distal rostrum raised, supporting a semi-elliptical arched mandibula, wider than long (Plate I, Fig. 5a), with a proximal tongue inserted in the proximal foramen separated by two stout condiles from the larger, distal one (Plate I, Fig. 5b).

One single subtriangular kenozooid observed at the nodal level; the opesium a small, subcentral, rounded angles triangle.

The basal rootlets were detached from the colony, but probably originated from the proximal portion of the frontal wall of some basal zooids.

*Derivatio nominis*: From Prof. Sebastiano Italo Di Geronimo, Coordinator of the Benthos sector for the P.N.R.A. (National Programme of Antarctic Research).

#### DIMENSIONS

(10 measurements; in  $\mu$ ): MIN MAX MEAN S. D.

Zooidal Length:	625	775	695	55,09
Zooidal Width:	600	700	669	34,98
Opesium Length:	113	150	133	13,26
Opesium Width:	200	300	263	28,99
Avicularium Length:	375	600	488	89,95
Avicularium Width:	200	350	281	42,19

Holotype deposited in the Instituto Policattedra di Oceanologia e Paleoecologia Museum: IPOPOP. B1. 8.8.1991. Catania, Italia.

### DISCUSSION

Besides the present species, the genus *Melicerita* is represented in the antarctic waters also by two other endemic species *Melicerita obliqua* (Thornely, 1924) and *Melicerita latilaminata* Rogick, 1956.

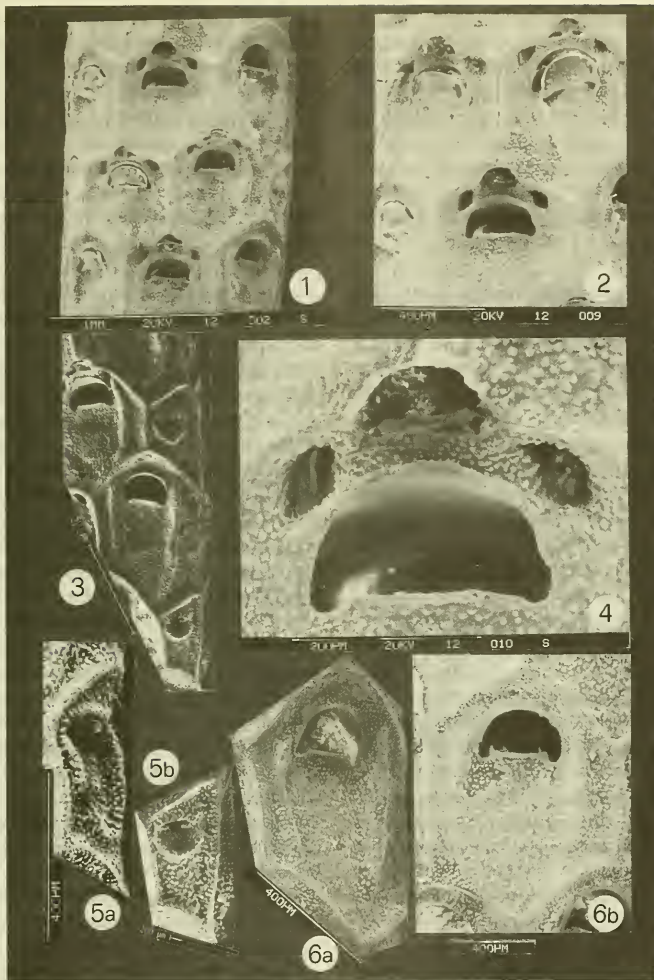


PLATE I. *Melicerita digeronimoi* sp. nov. Terra Nova Bay (Ross Sea, Antarctica): Station ID16; 681 metres. Fig. 1. Part of the colony with sterile and mature zooids (x 47). Fig. 2. Fertile zooid in a senile ontogenetic stage: the ovicell is visible from the outside as a swelling of the distal zooids (x 75). Fig. 3. Portion of the convex zoarial edge. Note the lightly raised ridge along the colonial edge and the position of the avicularia which alternate at the end of transversal rows of the two sides of the colony (x 56). Fig. 4. Detail of the opesium of a fertile zooid and aperture system of the ovicell with the central, semicircular, transverse opesium and the two lateroproximal subquadrangular pores (x 265). Fig. 5. Vicarious marginal avicularia: a) with a semicircular, arched mandibular resting on the rostrum (x 115) and b) without the mandibula to see the stout condyles. (x 100). Note the different development of the cryptocyst ridges. Fig. 6. Sterile zooids (x 105). Note: the proximal lip of the opesium extending in a large, straight process whose ends fold inwards forming two divergent, thin condyles; the peristomial thin, raised, finely beaded edge, and the different development of the cryptocyst.



The former, described by Thornely (1924) as *Aspidostoma abliquum* on specimens from the Commonwealth Bay (Adelie Land), at a depth of 201 metres, has been repeatedly quoted both from Ross Sea area (Rogick, 1956; Winston, 1983; Hayward & Thorpe, 1989; Rosso, 1990) and from several other localities (Androsova, 1972; Ristedt in Sieg & Wagele, 1990) and effectively seems to be very common, with a circumantarctic distribution and a large bathymetric range going from 100 to 3.560 metres.

The latter, more recently described for the first time by Rogick (1956) on specimens sampled off Cape Royds (Ross Island, Ross Sea), at a depth of 106 metres, is known, besides in the Ross Sea, also from the Antarctic Peninsula (Palmer Archipelago: Hayward & Thorpe, 1989; Margaret Bay and Gerlache Strait: Moyano, 1969) from the Lars Cristensen Land (King William Land): collection of the Antarctic Russian Exped. *vide* Androsova, 1972, from the Point Géologie Archipelago (Adelie Land); Androsova, 1972; Arnaud, 1974 and from the Shetland Isles (Moyano, 1978; Hayward & Thorpe, 1989). Moreover, this species seems to have a shallower bathymetric range going from 106 to 351 metres.

Both species live in the Ross Sea but are easily distinguishable from *M. digeronimoi* sp. nov. This latter species, in fact, differs from *M. obliqua* for the opesium shape (semicircular instead of a narrow crescent), for its opesial position which is constantly coaxial to the zooid and never inclined (feature of *M. obliqua*), for the presence of avicularia (which are absent in *M. obliqua*), for the larger ovicell pores. *M. digeronimoi* sp. nov. is distinguishable from *M. latilaminata* for the form of the opesium (half-moon shaped in *M. latilaminata*), for the form and the size of the proximal oral condyles (which are triangular and very robust in *M. latilaminata* but thin and folded inwards in *M. digeronimoi* sp. nov.), for the presence of ovicell pores (absent in *M. latilaminata*), for the different form and distribution of the interzoecial avicularia (*M. digeronimoi* sp. nov. having relatively small avicularia with distal mandibulae distributed only along the convex margin of the colony, while *M. latilaminata* has relatively large avicularia with proximal

mandibulae, which are randomly distributed).

Besides in the Antarctic, the genus *Melicerita* is at present only known to exist in Austral waters, with seven species, five of which have been described in the last twenty years. Of these, three seem to be limited to the subantarctic region and four are localized in New Zealand waters.

The subantarctic species are *Melicerita atlantica* Busk, *Melicerita blancoae* Lopez Gappa and *Melicerita subantarctica* d' Hondt.

*M. atlantica* was instituted from a single specimen from the Argentinian continental slope, off the Rio della Plata, at a depth of 1.098 m on a rocky bottom, by Busk (1884). The species is characterized by very wide hexagonal zooids with a central, semicircular opesium, with only two proximal teeth and (?) no distal ones, by an ovicell with a single, crescent-shaped orifice and by the absence of avicularia. These are the features which distinguish it very well from *M. digeronimoi* sp. nov.

*M. subantarctica* is very similar to *M. atlantica*, the former having been described recently by d' Hondt (1984) on samples from the French Austral islands (Campagna MD 24) in the vicinity of Léna. This species also presents particularly short and wide zooids with a uniformly grainy frontal wall, a subcentral, semicircular zooidal opesium which, however, definitely has four oral condyles, two proximal and two distal, an absence of pores or porous areas connected to the ovicell, as well as the apparent absence of avicularia. Furthermore, this species seems to be characterized by an ovicell orifice of large dimensions (especially as regards the width). The two species seem very close and it would be as well to recheck the specimens in order to clarify the position of the two above-mentioned taxa.

Finally, *M. blancoae* was instituted by López Gappa (1981) on samples taken in the deep waters of the Patagonia Shelf. It was later recognized by Hayward & Thorpe (1989) in samples from the Falkland Isles and from Burdwood Bank at depths between 74 and 463 m. *M. blancoae* is easily distinguished from all the other antarctic species for the presence on the autozooidal orifice of two robust and well visible distal condyles besides the two proximal ones, as well as for the constant

marginal cenozooids and the sporadic interzoecials. Furthermore, it differs from *M. digeronimoi* sp. nov. for its much larger dimensions (with several zooids in each row), for the dichotomic branches as well as for the absence of avicularia.

The other four species seem to be characteristic of the Australian and New Zealand area.

*Melicerita angustiloba*, instituted by Tenison-Woods (1862) on Tertiary specimens from New Zealand, Victoria and Southern Australia, has been recently noted in New Zealand waters by Powell (1969) and later by Gordon (1986) in correspondence to the Challenger Plateau, in muds, at depths of between 132 and 688 metres. This species differs strongly from *M. digeronimoi* sp. nov. for the very large, noticeable ovicell on the distal part of the mother zooid, of which it occupies the whole disto-lateral portion to the opesium, in a fan shape, with a very thin, finely beaded wall and with rows of beads in the lateral portion. Also for the subcentral position of the opesium and for the presence of two distal teeth besides the proximal condyles, and for the type of interzoecial avicularia rather than vicarious ones.

*Melicerita ejuncida* was described by Gordon (1986) on New Zealand specimens from depths between 132 and 1.029 metres. It is characterized by extremely reduced dimensions of the colony, with zooidal rows with only two zooids and one avicularium on each side, a large semicircular distal opesium with proximal condyles and not evident distal ones, a swollen ovicell which occupies the whole part from the opesium to the distal

margin of the mother zooid, with thin, finely beaded wall. Despite a certain affinity to *M. digeronimoi* sp. nov. (small sized colonies and form of the zooidal opesium), this species can be easily distinguished from it by the morphology of the ovicell and the dimensions of the zooids.

Finally, the other two species were described for the Chatham Islands, situated east of New Zealand, by Uttley & Bullivant (1972). These are *Melicerita knoxi* and *Melicerita chathamensis* sampled from bottoms of 530-549 m and 283 m respectively. Certain characteristics of these species are close to *M. digeronimoi* sp. nov. In fact, they have a preferential localisation of the avicularia, characterized by a relatively small opesium a curved mandibula, along the margins of the colony.

In detail, however, *M. knoxi*, whose autozooidal opesium and areolation are very similar to those of *M. digeronimoi* sp. nov., is different for the presence of a complete pivot bar of the avicularia, for the (much greater) size, form and (lateral and distal in relation to the opesium) position of the lateral pores of the ovicell.

*M. chathamensis*, which also has avicularia with a complete pivot bar, is different from *M. digeronimoi* sp. nov. for the deeply depressed cryptocyst and the (sometimes inclined) position of the aperture and its strongly half-moon form, which is much wider than long, with its depressed proximal lip, which is distally very protruding. This characteristic is even more evident in the ovicelled zooids which present an opesium which is a third larger in relation to the autozooids.

KEYS FOR THE IDENTIFICATION OF THE SPECIES OF THE GENUS *MELICERITA*  
MILNE-EDWARDS

1. Avicularia absent ..... 2  
 Avicularia present ..... 5
2. 2 proximal condyles. Crescent-shaped, very narrow opesium, sporadically oblique (characteristic). Ovicell with two small pores contiguous to the transverse, crescent-shaped opesium, situated distally to the zooidal opesium (Antarctic) ..... *Melicerita obliqua*  
 4 condyles: 2 (much lateral) proximal and 2 (subcentral) distal ones ..... 3
3. Ovicell with two porous areas situated between the zooidal opesium and the ovicell one. Opesium semicircular, in the distal third of the zooid. Condyles very stout. Kenozooids generally present along the edges. (Falkland Isles and Patagonia) ..... *Melicerita blancoae*  
 Ovicell with a single, very narrow, semilunar opesium. Autozooids transversely elongated, very large and relatively short ..... 4
4. Autozooids large (750  $\mu$ ) and relatively short (500  $\mu$ ). Opesium semicircular in the distal half of the zooid. Ovicell opesium as high as the autozooidal one but about twice as wide. (French Austral Isles) ..... *Melicerita subantarctica*  
 Autozooids large (890  $\mu$ ) and relatively short (650  $\mu$ ). Very wide, semicircular opesium, located in the central part of the autozooid. Presence of distal condyles uncertain. (Argentine continental slope) ..... *Melicerita atlantica*
5. Avicularia only along the zoarial margins ..... 6  
 Avicularia randomly present on the whole zoarium, without a complete pivot bar. Opesium crescent-shaped, with two triangular, stout, proximal condyles. Ovicell with a single, transversal, narrow opesium. (Antarctic) ..... *Melicerita latilaminata*
6. Avicularia with a complete pivot bar ..... 7  
 Avicularia with lateral condyles ..... 8
7. Subcentral, semi-elliptical opesium. Ovicell with two large, subtriangular pores which occupy the lateral and disto-lateral autozooidal opesium areas (Chatham Isles) ..... *Melicerita knoxi*  
 Opesium in the distal half of the autozooid, crescent-shaped, particularly short and wide, sometimes lopsided (inclined). Condyles absent. Cryptocyst deeply concave. Ovicell with two porous areas placed disto-laterally to the autozooidal opesium (New Zealand and Chatham Isles) ..... *Melicerita chathamensis*
8. Ovicell not very evident from the outside. Aperture complex formed by a semicircular opesium and two proximo-lateral, subelliptical pores, placed very near to the zooidal distal edge. Vicarious avicularia with distal opesia, situated only along one zoarial edge. Autozooidal opesium semicircular, subterminal, with the ends of the proximal middle process folded into two, inward divergent tongues. Kenozooids sporadically present. (Antarctic) ..... *Melicerita digeroninoidi* sp. nov.  
 Ovicell very large and easily visible from the outside, covering the distal third or half of the zooid, with a finely granular frontal wall and a simple transversal opesium. Cryptocyst generally flat, deeply concave only in the fertile zooids ..... 9



9. Colony very small (10 mm high and 0.75 mm wide), with zooidal rows comprising only two zooids and an avicularium on each side. Opesium relatively distal and large, semicircular, with the proximal lip wide and straight, with the ends folded inwards to form two little tongues; distal condyles not evident. Ovicell very evident somewhat wider than the zooidal opesium (New Zealand) ..... *Melicerita ejuncida*

Colony bigger than the previous species. Opesium subcentral with 2 proximal and 2 evident distal condyles. Mature zooids very enlarged. Ovicell with a single sinuate opesium, short and very wide, occupying the entire area situated laterally and distally to the zooidal opesium. (New Zealand) ..... *Melicerita angustiloba*

## CONCLUSIONS

The genus *Melicerita*, created by Milne-Edwards (1836) for *M. charlesworthi*, a Tertiary and Quaternary European fossil species, as far as is known, comprises, besides some fossil species, also several Recent species whose distribution is restricted to temperate-cold and cold waters of the Austral hemisphere.

In particular, three endemic Antarctic species are known: *M. obliqua*, *M. latilaminata*, and *M. digeronimoi* sp. n. Among them, the former seems to have a very wide geographic and bathymetric distribution comprising the whole Antarctic area, from the continental shelf to the bathyal plain, while the others seem to be localized on the Antarctic continental shelf (pseudobathyal faunas of Andriashev, 1978).

Among the subantarctic species (*M. atlantica*, *M. blancoae* and *M. subantarctica*), nearly all known from a single sampling site, the first two seem to be typical of the continental shelf while *M. subantarctica*, sampled near the Lena bank, is a "thalassobathyal" species (*sensu* Andriashev, 1978).

Finally, among the New Zealand region species (*M. angustiloba*, *M. chathamensis*, *M. knoxi* and *M. ejuncida*), the latter seems to be particularly eurybathic with a distribution going from the continental shelf to the abyssal plain, while the first three ones seem to be exclusively localized along the continental slope.

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