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Dasyskenea dibellai n. sp. from the Central Mediterranean Sea (Gastropoda Vetigastropoda Skeneidae)

Italo Nofroni[1], Walter Renda[2*], Franco Agamennone[3] & Salvatore Giacobbe[4]

[1]Via B. Croce 97, 00142 Rome, Italy; e-mail: italo.nofroni@uniroma1.it
[2]Via Bologna 18/A, 87032 Amantea, Cosenza, Italy; e-mail: w.renda1@tin.it
[3]Via Quarto dei Mille, 15, 65122 Pescara, Italy; e-mail: info@studioagamennone.it
[4]Messina University, ChiBioFarAm Department, Viale Stagno D'Alcontres 31, 98166 Messina, Italy; e-mail: sgiacobbe@unime.it
[*]Corresponding author

ABSTRACT *Dasyskenea dibellai* n. sp. from the central Mediterranean Sea, collected off Marsala, Western Sicily, 133 m depth, in the Muddy Detritus Biocoenosis, is here described. The new species, characterized by small size, an almost planorbid profile and an evident transverse sculpture prevailing over the longitudinal one, is compared with the Skeneidae with such characteristics both from the Mediterranean Sea and the adjacent Atlantic Ocean. Due to the characteristics of the protoconch and the morphological affinity, the new species is assigned to the genus *Dasyskenea* Fasulo et Cretella, 2003 together with *Skeneoides digeronimoi* La Perna, 1998 and the two North-East Atlantic related species, *Skenea nilarum* Engl, 1996 and *S. victori* Segers, Swinnen et De Prins, 2009. In the context of comparisons, *Skenea costulata* Sbrana et Siragusa, 2018 is considered probable synonymous with *Skenea divae* Carrozza et van Aartsen, 2001.

KEY WORDS Taxonomy; northeastern Atlantic Ocean; Mediterranean Sea.

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INTRODUCTION

The family Skeneidae Clark W., 1851 includes numerous small species found in all the seas worldwide and at all depths. Despite this, the anatomical and genetic knowledge on this family is still largely incomplete, which means that the assignment to currently known genera has been carried out exclusively on the basis of morphological characters and many species therefore do not find an adequate location.

As far as concerns the Mediterranean Sea, this family includes 11 genera with 27 species (S.I.M. mediterranean checklist 2021), six of which are characterized by transversal sculpture prevalent over the longitudinal one, similarly to the new species here described, but placed in three distinct genera: *Skeneoides* Warén, 1992, *Dasyskenea* Fasulo et Cretella, 2003 and *Skenea* Fleming, 1825 (sl). The latter genus was actually adopted in the absence of a specific genre of reference that would take into account not only a generic morphological affinity, but also a real genetic proximity.

In any case, lacking DNA data, we believe that all these species must be redistributed among these three genera based only on morphological characters, as they are the only ones currently available.

Therefore, in our opinion, the genus *Skeneoides* Warén, 1992 (type species *Delphinula exilissima* Philippi, 1844, recent, from the Mediterranean Sea) due to morphological characteristics such as deviated protoconch, and the presence of longitudinal cords clearly visible along the entire length of the whorls, should be used exclusively for the type species and the similar *S. formosissima* (Brugnone, 1873).

The remaining species with deviated protoconch and longitudinal cords absent or recognizable only on portions of the worls, including the n. sp. described here and the two other ones known for the north-eastern Atlantic, should be assigned to the genus *Dasyskenea* Fasulo et Cretella, 2003 (species type *Dasyskenea suavis* Fasulo et Cretella, 2003, recent, from the Mediterranean Sea).

Finally, the species without longitudinal cords and with a non-deviated protoconch, currently find a convenient location in the genus *Skenea* Fleming, 1825 (s.l.) (species type *Helix serpuloides* Montagu, 1808, recent, Great Britain). To this group is assigned *Skenea divae* Carrozza et Aartsen, 2009 and *S. costulata* Sbrana et Siragusa, 2018, both Mediterranean, but of dubious specific distinction, as well as the Atlantic *Skenea ponsonbyi* (Dautzenberg et Fischer 1897).

MATERIAL AND METHODS

Soft bottom samples were collected on June 1996, in the framework of the "SERENA III" Cruise, aimed to investigate the association of pelagic fish schools with the nature of the seabed off the southern coast of Sicily (D'Elia et al., 2009).

Sampling was carried out by means of a modified Van Veen grab, 0.25 m^2 sampling surface. The collected sediments were washed on board, employing a gentle seawater flow throughout 1 mm mesh sieve, and the retained sample was fixed in 70% alcohol. The living motile fauna was sorted on board under stereomicroscope, and the residual sediment with related death assemblages was dried in 45 °C muffle.

Random subsamples of dried sediment were examined in the laboratory under stereomicroscope, where mollusk shells were sorted, and specimens determined to species level, as far as possible. Between them, the sample AX2 provided several shells of an initially indetermined species, dubiously assigned to the genus *Skenea*. Later, accurate morphological investigations have been carried out on such specimens. Moreover, stereomicroscope and SEM photographs were compared with literature images and original photos of related species.

ABBREVIATIONS. MCZR = Museo Civico di Zoologia, Rome, Italy. MNHN = Museum national d'Histoire Naturelle, Paris, France. SMF = Senckenberg Research Institute and Natural History Museum, Frankfurt am Main, Germany. BEL = Benthic Ecology Laboratory, Messina University, Italy. UB = Dipartimento di Scienze della Terra e GeoAmbientali, Università di Bari, Italy. AD = Antonino Di Bella, Patti, Italy. FA = Franco Agamennone, Pescara, Italy. IN = Italo Nofroni, Rome, Italy. WR = Walter Renda, Amantea (Cosenza), Italy. SEM = Scanning electron microscope. S.I.M. = Società Italiana di Malacologia

RESULTS

Systematics

Classis GASTROPODA Cuvier, 1795
Subclassis VETIGASTROPODA Salvini-Plawen, 1980
Superfamilia TROCHOIDEA Rafinesque, 1815
Familia SKENEIDAE Clark W., 1851
Genus *Dasyskenea* Fasulo et Cretella, 2003

Dasyskenea dibellai n. sp. - Figs. 1–11, 29
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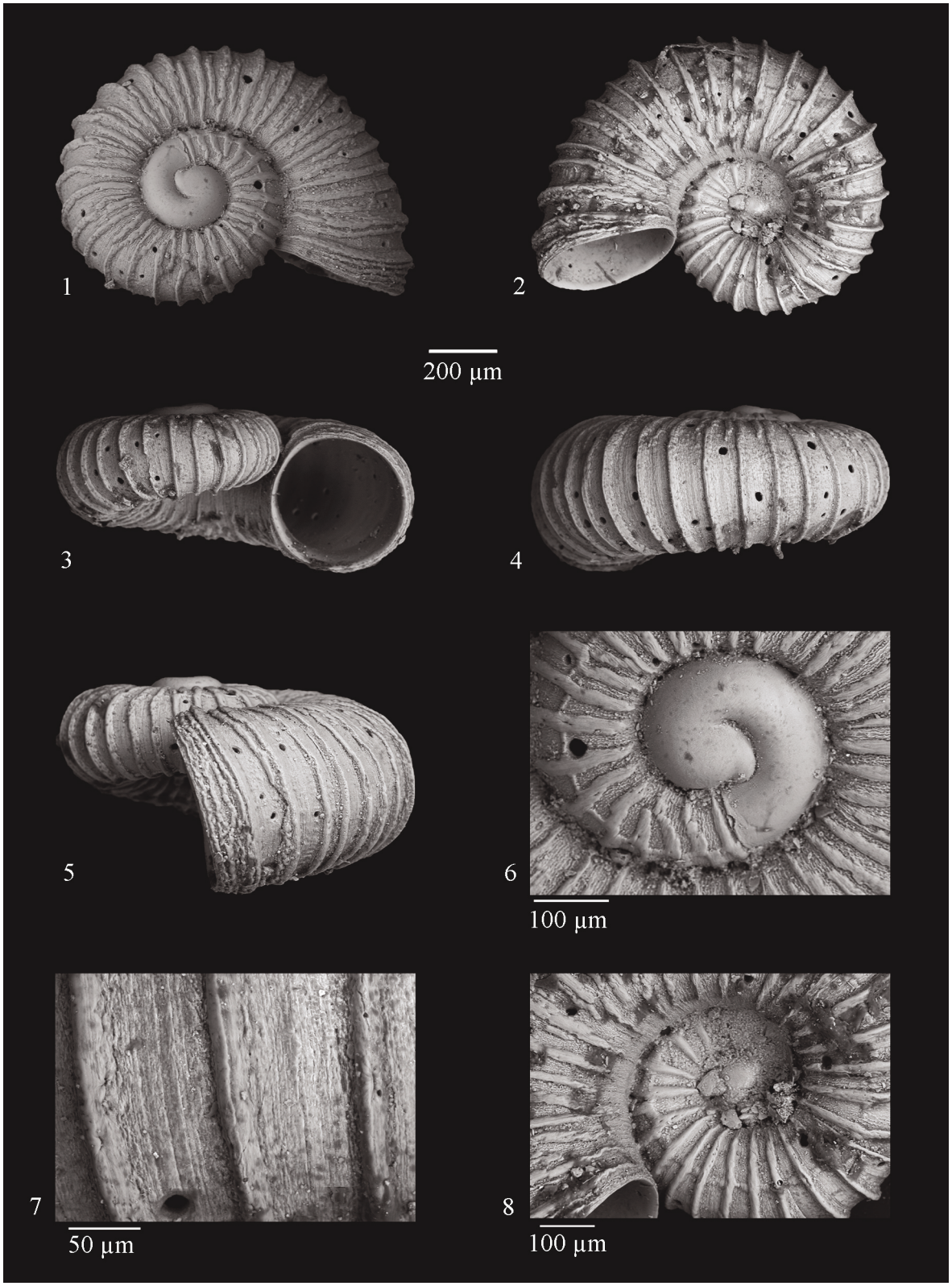
TYPE MATERIAL. Strait of Sicily, 11 km off Marsala (St. AX2; 37°46'14" N, 12°18'58" E), 133 m depth. Holotype in SMF n. 363257. Paratype in SMF n. 363258. Paratype in MCZR n. MCZR–M–TYPE 00108. 2 paratypes: BEL153SERENA III.9, *S. dibellai* 1, 2. 2 paratypes: IN. 4 paratypes in FA. 2 Paratypes in WR. 38 paratypes in AD.

OTHER EXAMINED MATERIAL. *Skeneoides exilissima* (Philippi, 1844): over a hundred shells from most of the Mediterranean Sea (IN and WR).

Skeneoides formosissima (Brugnone, 1873): six shells from the Sicilian coasts (IN and WR), 11 shells sub nomine *Circulus jeffreysii* (coll. Monterosato, MCZR) and 11 syntypes of *Circulus formosissimus* Brugnone 1873 (MCZR).



Figures 1–8. *Dasyskenea dibellai* n. sp. holotype, Strait of Sicily, 11 km off Marsala, SMF n. 363257.

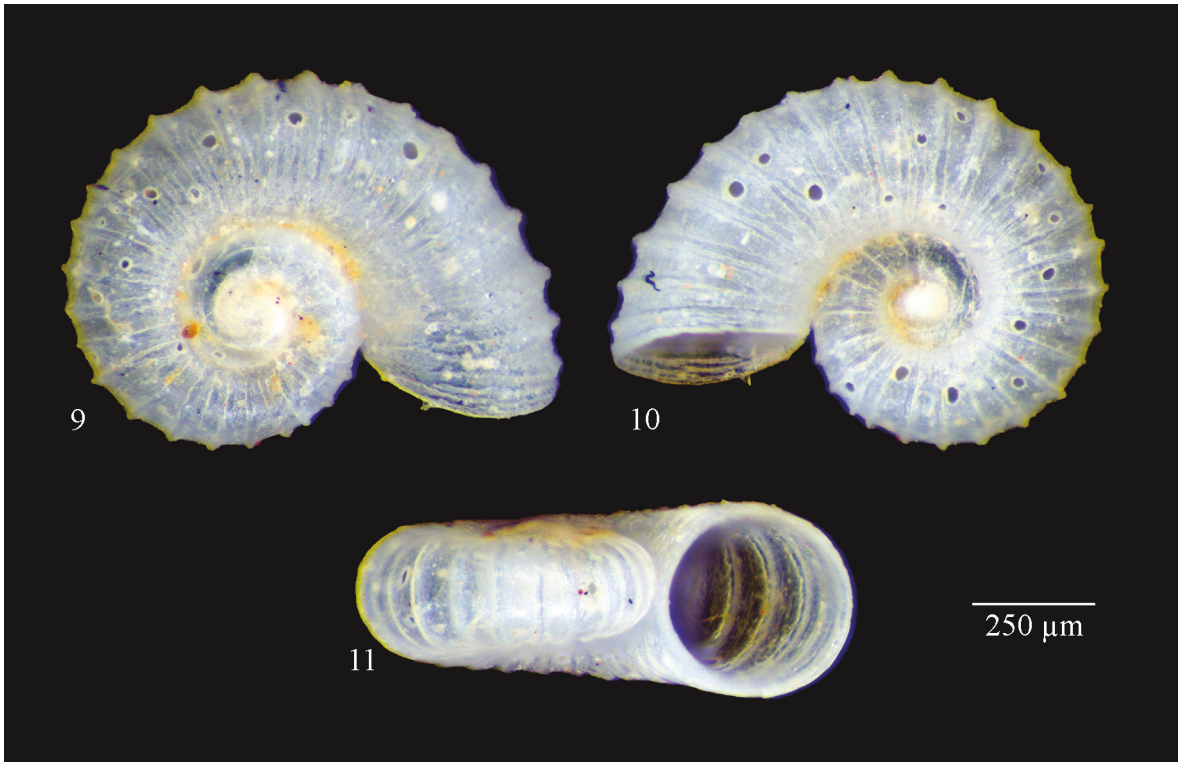
Dasyskenea suavis Fasulo et Cretella, 2003: one shell from Sicily Channel (WR).

Skenea divae Carrozza et van Aartsen, 2001: three shells from the Tuscan Archipelago between 300 and 400 m depth (IN).

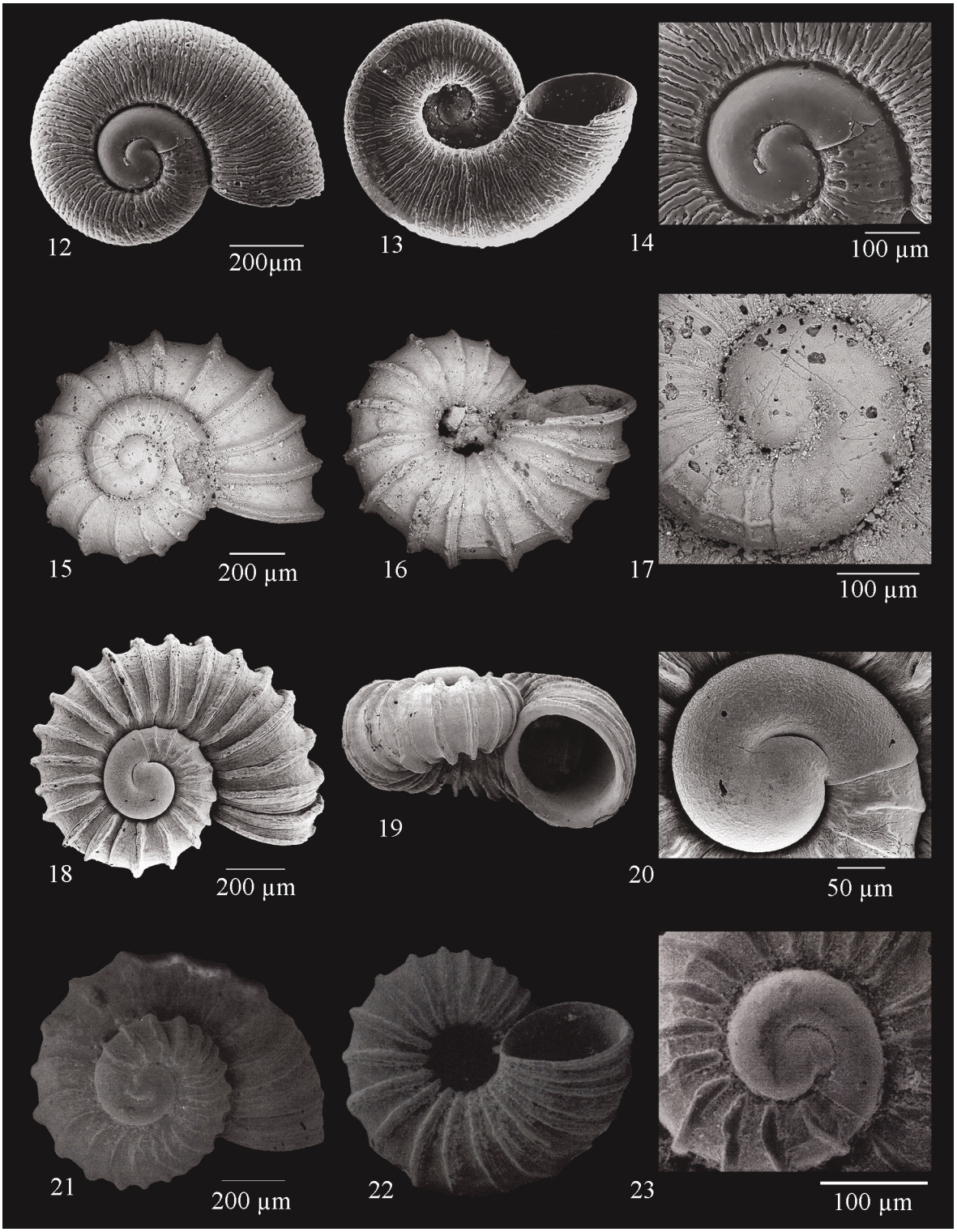
Skenea nilarum Segers, Swinnen et de Prins, 2009: two shells from Lanzarote Isand., - 35 m (IN).

DESCRIPTION OF THE HOLOTYPE. Shell small sized, whitish, matt, almost planispiral. Apex depressed, slightly protruding over the last body-whorl, which weakly degrades as it approaches the peristome (Figs. 1–5). Protoconch formed by about 1.25 whorls without sculpture, with an "S" shape, therefore with an initially left-handed and then regularly right-handed winding. Diameter of 270 µm (Figs. 6, 29). Teleoconch approximately 1.40 whorls rapidly increasing, with deep sutures. The sculpture of the last whorl of teleoconch consists of 36 irregular, flat, almost vertical axial ribs running from the upper to the lower suture. These main ribs alternate with semi-ribs that start from the sutures and are interrupted before reaching the periphery. Often these half-ribs are partially or completely fused with the main ribs. Surface between the coasts crossed by very numerous and very thin growth striae (Figs. 3–8). Spiral sculpture, present only in the first half turn of the teleoconch, consisting of two thin cords starting from the separation line between protoconch and teleoconch, one runs centrally along the dorsal side and the other the basal side (Figs. 1, 2 and 8). Round and broad umbilicus, which allows viewing of the entire lower surface of the whorls. Almost circular and continuous opening. Operculum and soft parts unknown. Dimensions: 1.02 mm in diameter and 0.52 mm in height.

VARIABILITY. Dimensions: up to 0.91–1.06 mm in diameter and 0.49–0.55 mm in height. Diameter of 266–275 µm. Teleoconch approximately 1.25–1.45 whorls. Axial ribs of the last whorl of teleoconch 32–44. All available specimens show a variable number of small holes, irregularly distributed along the whole shell surface (Figs. 1–11). The holes, although similar in shape to predation traces by Naticidae gastropods, are too small to have this origin. Moreover, similar but less defined



Figures 9–11. *Dasyskenea dibellai* n. sp. paratype, Strait of Sicily, 11 km off Marsala, SMF n. 363258.



Figures 12–14. *Dasyskenea suavis* holotype MZB30000 (H=0.34 mm, D=0.81 mm), Sicilian Channel, 8 miles north of Pantelleria (Trapani). Figures 15–17. *Dasyskenea victori* paratype MNHN-IM-2010-12054, Madeira, off Aeroporto, -260 m. (H=1.0 mm, D=1.4 mm). Figures 18–20. *Dasyskenea nilarum* holotype SMNH n°4787, Puerto del Carmen, Lanzarote, Canary Island, depth 25–50 m. Figures 21–23. *Dasyskenea digeronimoi* holotype, University Palaeontological Museum, Catania; the Accademia Cave, Ustica Island, southern Tyrrhenian Sea, 3–4 m. (H=0.74 mm, D=0.93 mm).

perforations can be observed in other relative species (Figs. 15–20, 30–32), suggesting they might all affected by a common adverse biological factor.

DISTRIBUTION AND BIOLOGY. The type locality, Strait of Sicily, 11 km off Marsala, is characterized by botton sediments consisting in a mixture of plastic mud (38%), sand (33%) and clay (29%), covered by a centimetric fluid layer. Inside the sediments, biogenic clasts and cores of decomposed organic matter were recognizable, testifiyng a high biological activity. Based on such features, a Muddy Detritus Biocoenosis (DE, according to Pérès & Picard, 1964; Pérès, 1982) can be hypotized, although the lack of macrozoobenthic fauna does not allow confirmation.

ETYMOLOGY. The new species is dedicated to our friend Antonino Di Bella (Patti, Italy) who was the first to realize that the specimens found belonged to an undescribed species.

REMARKS. *Skeneoides exilissima* (Philippi, 1844) and *S. formosissima* (Brugnone, 1873), were recently treated by Nofroni & Renda (2021) with the definition of the correct name to be used for the second, and this work is referred to for the iconography. Both are distinguished from the new species by the evident transverse sculpture consisting of alternating main and secondary ribs, without semi-ribs, the longitudinal ribs (from 4 to 12) present on the entire surface of the whorls, the protoconch characterized by a lateral expansion in the shape of a semicircle and not in the shape of an "S" as in the new species.

Dasyskenea suavis Fasulo et Cretella, 2003 (Figs. 12–14, 24) has about 80 transversal, irregular, very close ribs, against 32–38 of *D. dibellai* which also has semi-ribs. The spiral cords are barely outlined and it is difficult to identify them; there are 2 of them for short stretches on the upper side and 3, more visible, on the lower side, compared to the 2 total of *D. dibellai.* The protoconch has a very evident S-shaped deviation.

Dasyskenea digeronimoi (La Perna, 1998) (new combination) (Figs. 21–23, 27) has a variable but generally higher profile than the new species. The turns have about twenty irregular ribs, without half-ribs, among which the surface of the shell is sprinkled with granules not present in the new species. The upper side is crossed by a spiral cord, not always visible, while in the lower side a slight spiral sculpture can be observed only for some sections, while the new species has only two cordons which for a short distance run along the upper and lower sides. It is placed here in the genus *Dasyskenea.*

Dasyskenea victori (Segers, Swinnen et De Prins, 2009*)* (new combination) (Figs. 15–17, 26), known for Madeira, has a much lower number of ribs than *D. dibellai* (14–16 compared to 32–38) and no semi-ribs. From 3 to 5 spiral cords are barely visible (compared to the 2 of *D. dibellai*) which, both above and below, cover only a short stretch of the turns. The photo of the protoconch (Figs. 17, 26) does not fully clarify its characteristics, but in the original description it is specified that it is "slightly distorted". For this and for the other characters, it is here placed in the genus *Dasyskenea*.

Dasyskenea nilarum (Engl, 1996) (new combination) (Figs.18–20, 25), endemic to the Island of Lanzarote (Canary Islands), is very reminiscent of *D. dibellai* for its general appearance, from which it is distinguished by the lower number of ribs (13–25), the lack of semi-ribs, the lack of spiral cords, the deviated protoconch, slightly wrinkled and finely porous (clearly visible in Engl, 1996 fig. 4). Due to its morphological characteristics, it is placed here in the genus *Dasyskenea*.

As mentioned, it is not clear whether *Skenea divae* Carrozza et van Aartsen, 2001 and *S. costulata* Sbrana & Siragusa, 2018 (Figs. 28, 30–32) are really distinct species.

The Authors base the specific distinction above all on "*the characteristic central elevation*" of *S. costulata* with respect to *S. divae*, but the two protoconches are absolutely identical both in size (180 μm) and in shape; the SEM photo by Peñas et al. (2006: 54) seems to give greater importance to apex more protruding, but this is only due to the different characteristics of the two detectors of the SEM microscopes used. The only element that seems to separate them is the trochiform profile in *S. divae* compared to the almost planispiral one in *S. costulata*.

In any case, the two entities are distinguished from the new species by the absence of spiral cords, but above all by the protoconch of regular shape, without deviations of any kind.

Very similar to the two previous species is the Atlantic *Skenea ponsonbyi* (Dautzenberg et Fischer, 1897: 176, pl. 4 figs. 12–14) described for the Azores Islands and recently cited by Hoffman et al. (2020: 72, 73, fig. 61) from the South Azorean

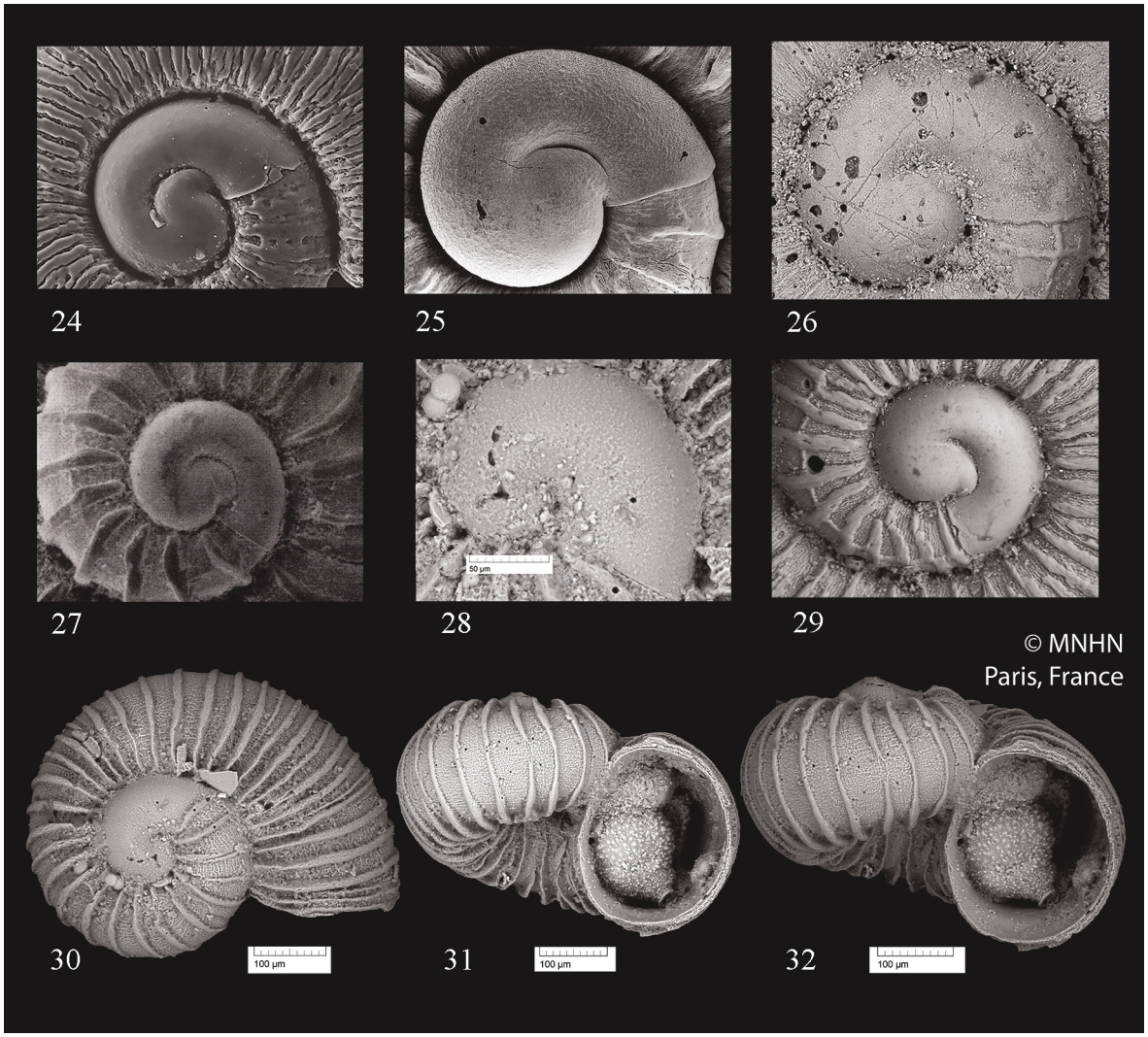


Figure 24. *Dasyskenea suavis* holotype MZB30000. Figure 25. *Dasyskenea nilarum* holotype SMNH-4787. Figure 26. *Dasyskenea victori* paratype MNHN-IM-2010-12054. Figure 27. *Dasyskenea digeronimoi* holotype University Palaeontological Museum, Catania, Italy. Figure 28. *Skenea costulata* holotype, Capo Corso 500 m depht. Figure 29. *Dasyskenea dibellai* n. sp. holotype. Figures 30–32. *Skenea costulata* holotype.

Seamount Chain and by Gofas et al. (2021: fig. 15 E, F) from the Galicia Bank (NE Atlantic Ocean). Compared to *D. dibellai*, it has a trochiform profile, considerably larger dimensions (up to 2.7 mm), about thirty irregular ribs, without half ribs. The protoconch has no deviation.

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