

# A new species of Steromphala J.E. Gray, 1847 (Gastropoda Trochidae) from Sicily Channel

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ABSTRACT	A new species belonging to the genus Steromphala Gray, 1847 (Gastropoda Trochidae), based
	on shell characters is described from the Sicily Channel. Steromphala federicii n. sp. is here
	compared with the most closely related species showing marked sculpture, namely S. racketti
	(Payraudeau, 1826), and S. nivosa (A. Adams, 1853) which is endemic of the close area of
	Malta. The new species, exclusively found in the Skerki Bank, cannot yet be confirmed as
	endemic, due to the present limited knowledge about the Sicily Channel banks.
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**KEY WORDS** Trochidae; Mediterranean Sea; Skerki Bank; Recent; *Steromphala*; new species.

Received 03.12.2024; accepted 28.02.2025; published online 30.03.2025

## INTRODUCTION

Following the preliminary tests of Barco et al. (2013) on the applicability of DNA barcoding for Mediterranean species of top-shells, *Gibbula* s.l., molecular investigation ultimately distinguished the genus *Steromphala* J.E. Gray, 1847 from the sister genera *Gibbula* Risso, 1826, and *Phorcus* Risso, 1826 (Affenzeller et al., 2017). Such results allowed to morphologically characterize the three distinct genera, solving uncertain due to the rather vague original descriptions of *Gibbula* and *Phorcus*, and their highly variable shell morphology.

According to Affenzeller et al. (2017), distinctive characters of the genus *Steromphala* consist in subtriangular shell shape and concave base. The umbilicus is open and may be set off the shell base by an umbilical atrium. Moreover, the upper and lower aperture attachment points are separated by a quarter turn of the whorl or less ( $\alpha \leq$ 90°). As far as concerns the shell surface ornamentation, fine ridges and striae are present, but differently from the genus Gibbula, prominent nodes or cusps lack. According to WoRMS (2024), 16 species have been yet recognized as belonging to the genus Steromphala, 11 of which having a strictly Mediterranean distribution, while three species are known from East Atlantic and Mediterranean, but one of these, Steromphala pennanti (R.A. Philippi, 1851), does not spread beyond the Alboran Sea, and only two can be considered as purely East Atlantic. Inside the Mediterranean, moreover, most species show disjoined or scattered distribution, and even an exclusive endemism is known, namely the threatened S. nivosa (A. Adams, 1853), from the Maltese Archipelago (Evans et al., 2011).

Recently, research carried out in the Skerki Bank, a Mediterranean area that in past has been poorly investigated, provided some shells whose morphology and sculpture agree with the genus *Steromphala*, but different from those of any known species. In this paper, the studied shells are described, and based on their distinctive characters have been assigned to a new species.

## **MATERIAL AND METHODS**

In the framework of scientific expeditions sponsored by the Fundación Oceanogràfic Valencia, the Mission Skerki "El Ultimo Edèn" was aimed to investigate some submerged reliefs between the North African and Sicilian coasts. From one of these, the Skerki Bank, Sicily Channel (37°46'552" N, 10°50'239" E), a sediment sample was collected on September 10, 2023, during a preliminary SCUBA diving survey. Precisely, a volume of 1000 cc of sediments has been manually collected from the entrance of a GSO, 20 m depth. The sample, fixed in Ethanol 96% was transferred at the Fundación Oceanogràfic Valencia department of Conservation, where it was sorted under stereomicroscope.

From the mollusc death assemblage, a total of 86 shells and fragments of an undetermined trochidae species were sorted out. The best preserved 16 adult and 9 juveniles specimens have been selected to designate holotype and paratypes. Macrophotographs have been carried out by means of a KERB stereomicroscope equipped with a Amscope Mu500 camera. Micromorphological features have been investigated by FEI Quanta 450, Thermo Fisher Scientific SEM, Spain in high vacuum, at a 5.00 kV acceleration voltage, at the University of Valencia, Support Service for Experimental Research.

ABBREVIATION. ASC: Andrea Spinelli Collection, Valencia, Spain; BEL: Benthic Ecology Laboratory, Dipartimento ChiBioFarAm, UNIME, Messina, Italy; FOV: Fundación Oceanogràfic Valencia, Valencia, Spain. IGC: Ivan Gatì Collection, Montedoro (Caltanissetta), Italy; MRSN: Museo Regionale di Scienze Naturali, Sezione di Zoologia, Torino, Italy; SGC: Salvatore Giacobbe Collection, Messina, Italy; MNCN: Museo Nacional de Ciencias Naturales, Madrid, Spain; sh: shell/shells.

# RESULTS

#### **Systematics**

Classis GASTROPODA Cuvier, 1795 Subclassis VETIGASTROPODA Salvini-Plawen, 1980 Ordo TROCHIDA Superfamilia TROCHOIDEA Rafinesque, 1815

Familia TROCHIDAE Rafinesque, 1815

Subfamilia CANTHARIDINAE J.E. Gray, 1857

Genus Steromphala J.E. Gray, 1847

TYPE SPECIES: *Steromphala cineraria* (Linnaeus, 1758)

### Steromphala federicii n. sp.

https://www.zoobank.org/E17C4D6D-6D1C-416A-9B54-8AA3319BD341

DIAGNOSIS. Minute and solid shell, slightly rounded, almost depressed, with about 2.5 whorls in the adult. Teleoconch with flattened thin spiral cords (8–9 on the last whorl), slightly thinner than the interposed furrows. Thin but distinct 8 basal cords. Shell surface bright, goldish, with light brown and pinkish spots, most evident on the last whorl.

TYPE LOCALITY. Skerki Bank (Sicily Channel), 37°46'552" N, 10°50'239" E.

TYPE MATERIAL. Holotype. SICILY CHANNEL • 1 sh; Skerki Bank; 37°46'552" N, 10°50'239" E; 20 m depth; 10 Sep. 2023; 1.9 mm high, 2.2 in diameter, Figs. 1-10; MRSN M5000. Paratypes. SICILY CHANNEL • 1 sh; same data as holotype; MNCN 15/05.200555 • 1 sh; same data as holotype; BEL185SK2023SF1 • 1 sh; same data as holotype; ASC1SK2023SF1 • 1 sh; same data as holotype; IGC1SK2023SF1 • 1 sh; same data as holotype; SGC1SK2023SF1 • 1 sh; same data as holotype; FOV1SK2023SF1 • 1 sh; same data as holotype; FOV1SK2023SF2 • 1 sh; same data as holotype; FOV1SK2023SF3 • 1 sh; same data as holotype; FOV1SK2023SF4 • 1 sh; same data as holotype; FOV1SK2023SF5 • 1 sh; same data as holotype; FOV1SK2023SF6 • 1 sh; same data as holotype; FOV1SK2023SF7 • 1 sh; same data as holotype; FOV1SK2023SF8 • 1 sh; same data as holotype; FOV1SK2023SF8 • 1 sh; same data as holotype; FOV1SK2023SF9 • 1 sh; same data as holotype; FOV1SK2023SF10 • 1 sh; same data as holotype; BEL185SK2023SF2juv1 • 1 sh; same data as holotype; BEL185SK2023SF2juv2 • 1 sh; same data as holotype; BEL185SK2023SF2juv3 • 1 sh; same data as holotype; BEL185SK2023SF2juv4 • 1 sh; same data as holotype; BEL185SK2023SF2juv5 • 1 sh; same data as holotype; BEL185SK2023SF2juv6 • 1 sh; same data as holotype; BEL185SK2023SF2juv7 • 1 sh; same data as holotype; BEL185SK2023SF2juv7 • 1 sh; same data as holotype; BEL185SK2023SF2juv7 • 1 sh; same data as holotype; BEL185SK2023SF2juv8 • 1 sh; same data as holotype; BEL185SK2023SF2juv9.

OTHER EXAMINED MATERIAL. CHANNEL OF SICILY • 61 shell and fragments; same data as holo-type; BEL185SK2023SF3.

DESCRIPTION OF HOLOTYPE. Shell of very small size for the genus (1.9 mm high, 2.2 in diameter), solid. The short spire is subtriangular, almost depressed. Teleoconch of about 2.5 whorls, flattened, and separated by well-marked suture. The body whorl is obtusely angular at the periphery. Aperture prosocline, oblique, rhomboidal in outline. Sculpture consisting of very thin and flat spiral cords: 3 in the first whorl, 8 in the other whorls. Eight tiny basal cords not well distinguishable around the umbilicus. Spiral cords lighter than the furrows between them. The flat cords do not show divisions into additional micro-cords, except than close to the suture. At very high magnification, very faint prosocline growth lines can be distinguished. Columella orthocline. Umbilical area cream-golden with a wide and deep umbilicus. Shell surface almost bright, colour goldish with light brown and pinkish spots on the last whorl. Protoconch 257 µm in diameter, paucispiral, comprising about 1.2 whorls, weakly separated from the teleoconch, lacking ornamentation, white pinkish in color.

VARIABILITY. In the adult specimens of *S. federicii* n. sp. the average height, H, measured  $1.76\pm0.18$  mm; the average diameter, L, measured  $2.29\pm0.24$  mm, corresponding to  $0.77\pm0.04$  H/L ratio. Juveniles (9 specimens), measuring 1.7 mm maximum height, appeared slightly more depressed than the adults (H/L:  $0.75\pm0.06$ ). Sculpture and colour little variable. Especially in subadults and juveniles, the lower cord can be more prominent, making a slight angulation in the periphery. Shell surface in juveniles is more bright than in adults. SEM microphotography further supports the new species description (Figs. 4–10). High magni-



Figures 1–3. *Steromphala federicii* n. sp. adult, Holotype MRSN M5000.



Figures 4–10. *Steromphala federicii* n. sp., holotype (MRSN M5000), SEM images. Fig. 4: frontal view. Fig. 5: basal view. Fig. 6: apical view. Fig. 7: detail of the first gyres. Fig. 8: detail of the apex, lateral view. Fig. 9: detail of the apex, apical view. Fig. 10: detail of the protoconch, lateral view.

fication image of the protoconch, in particular, reveals scattered granules irregularly distributed on the otherwise smooth surface.

DISTRIBUTION AND BIOLOGY. Known only from the type locality. All shells were extracted from a sample collected at 20 m depth, in biogenic coarse sediments, facing a GSO.

ETYMOLOGY. The species name is after Federico Spinelli, father of the first author.

#### DISCUSSION

Steromphala federicii n. sp. is easily distinguishable from all other Atlantic and Mediterranean congenerics by being the smallest in size within the genus, and by presenting a teleoconch sculpture with flat spiral cords, which are always narrower than the grooves between them. The congeneric endemic *S. ni*vosa (A. Adams, 1853), further than in chromatic pattern, differs in being cyrtoconoid, transversely streaked and weakly striated longitudinally.

Some similarity exists with the widespread Mediterranean *S. racketti* (Payraudeau, 1826), a congeneric small sized species, notably variable in shall shape and colour. The shell of *S. racketti*, however, is larger than the new species, counting four to five whorls in the adult. It is also more solid and more deeply coloured. Shell shape is variable in proportions, but frequently higher than broader. The aperture is also different, as well as the umbilicus, which is comma-shaped and white in *S. racketti*, and round and dark pink in *S. federicii* n. sp.

All *S. federicii* n. sp. specimens were found concentrated in less than one square meter of sea bottom, very far from any obvious source of fossil remains, such as sedimentary rocks or Plio-Pleistocene deposits, being the surrounding rocks of igneous origin. The collection site, moreover, is located at the top of an offshore reef, which contrasts with the possibility of accumulation from vertical or side supply. Due to such considerations, despite only known from empty shells, we suggest that *S. federicii* n. sp. might be a recent species and characteristic of the environment in which it was sampled, namely the photophilic infralittoral.

The new species, although exclusively found in the Skerki Bank, cannot yet be considered an endemic species, due to the present limited knowledge about the Sicily Channel banks. The protoconch, nevertheless, testifying of a lecithotrophic development, suggests a limited larval dispersal capability and, consequently, a restricted geographical range, similarly to other new species of Trochidae also reported from the Skerki Bank area (Smriglio et al., 2014).

## ACKNOWLEDGEMENTS

This research has been sponsored by "Fundación Oceanogràfic Valencia" which strongly supported this study, by granting providing facilities and services. A relevant field research contribution was also provided by the documentarist Marco Spinelli, who photographed the *S. federicii* specimens studied. Thanks are given to Juan Antonio Romero Hernando (Mission Blue) and Hector Ripolles Gasco (Cressi Spain) for the support during the expedition "Mission Skerki. A special thanks to José Luis Crespo and Daniel García Parraga (Fundación Oceanogràfic Valencia, Spain) for their great help and support in the research about the conservation of marine ecosystems.

#### REFERENCES

- Affenzeller S., Haar N. & Steiner G., 2017. Revision of the genus complex *Gibbula*: an integrative approach to delineating the Eastern Mediterranean genera *Gibbula* Risso, 1826, *Steromphala* Gray, 1847, and *Phorcus* Risso, 1826 using DNA-barcoding and geometric morphometrics (Vetigastropoda, Trochoidea). Organisms Diversity & Evolution, 17: 789–812. https://doi.org/10.1007/s13127-017-0343-5.
- Barco A., Evans J., Schembri P.J., Taviani M. & Oliverio M., 2013. Testing the applicability of DNA barcoding for Mediterranean species of top-shells (Gastropoda, Trochidae, *Gibbula* sl). Marine Biology Research, 9: 785–793.

https://doi.org/10.1080/17451000.2013.765585.

Evans J., Borg J.A. & Schembri P.J., 2011. Distribution, habitat preferences and behaviour of the critically endangered Maltese top-shell *Gibbula nivosa* (Gastropoda: Trochidae). Marine Biology, 158: 603–611.

https://doi.org/10.1007/s00 227-010-1584-4.

Smriglio C., Di Giulio A. & Mariottini P., 2014. Description of two new *Jujubinus* species (Gastropoda: Trochidae) from the Sicily Channel, with notes on the Jujubinus curinii species complex. Zootaxa, 3815: 583–59. https://doi.org/10.11646/zootaxa.3815.4.8.