

## A NEW MEDITERRANEAN *SKENEOIDES* (GASTROPODA: SKENEIDAE) FROM A SHALLOW-WATER CAVE

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*Abstract* A new skeneimorph gastropod is described from a shallow-water cave in the Ustica Island (southern Tyrrhenian Sea), *Skeneoides digeronimoi*. It differs from *S. exilissima* (Philippi, 1844) and *S. jeffreysi* (Monterosato, 1872) by being almost lacking in spiral sculpture and is more high-spired. Although found as empty shells, *S. digeronimoi* n. sp. is believed to belong to the cave community, and not to the allochthonous shell material, also present within the cave.

*Key words* Skeneoides, Skeneidae, New species, Cave molluscs, Mediterranean.

### INTRODUCTION

The molluscan fauna from the Mediterranean submarine caves was formerly believed to be lacking in peculiarities (e.g. Cattaneo Vietti & Russo, 1987). Probably no Mediterranean mollusc will prove to be exclusive to cave environments, but the shallow-water caves anyway represent a "refuge" (Harmelin *et al.*, 1985) for a number of "uncommon" species, among which body-size reduction (miniaturisation, paedomorphosis), brooding, cryptic habits and deep-sea affinities are frequent, as also stressed by Kase & Hayami (1991) and Hayami & Kase (1993, 1996) for the Japanese cave molluscs.

New malacological data from the Mediterranean caves have been recently reported, such as a smooth-shelled and colourless ecotype of the gastropod *Homalopoma sanguineum* (Linné, 1758) by Di Geronimo *et al.* (1997), a new hyalogyrinid gastropod by Warén *et al.* (1997) and the new miniaturised arcid *Asperarca magdalenae* by La Perna (1998). Also the occurrence of the paedomorphic mytilid *Dacrydium hyalinum* (Monterosato, 1875) (Di Geronimo *et al.*, 1997; Warén *et al.*, 1997) should be remarked, as this genus typically comprises deep-sea species (Salas & Gofas, 1997). Another paedomorphic bivalve, *Nucula recondita* Gofas & Salas, 1995, also proves to be common within cave assemblages (Di Geronimo *et al.*, 1997; La Perna, unpubl. data).

A small gastropod was found in a shallow-water cave in the southern Tyrrhenian Sea. It proves to be an undescribed "skeneimorph", an informal group whose northeast Atlantic and Mediterranean species were monographed by Warén (1992). Also this species may prove to be a peculiar element of the Mediterranean molluscan cave assemblages.

### MATERIAL AND METHODS

The examined material comes from a cave developing in pyroclastic rocks in the Ustica Island (Fig. 1), known as Grotta dell 'Accademia (Accademia Cave). The cave is c. 40 m long and with two narrow openings, the main one at sea level, the other at a few metres depth. Part of the cave is semi-submerged, forming shallow "lakes", while the wholly submerged part does not exceed 3-4 m in depth (Colantoni *et al.*, 1989).

Investigations on the benthic assemblages (molluscs, bryozoans and serpuloids) from the Accademia Cave were carried out by Di Geronimo *et al.* (1994; 1997), who

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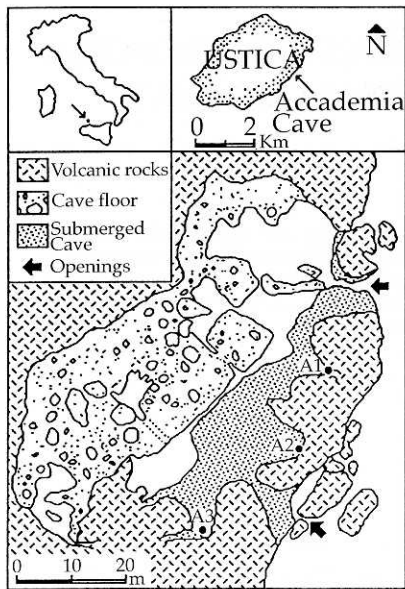


Fig. 1 Location and topography of the Accademia Cave (modified from Colantoni *et al.*, 1989). A1, A2 and A3 are the sampling sites of Di Geronimo *et al.* (1997).

pointed out compositional discrepancies between community and thanatocoenosis, the former fitting a "typical" cave assemblage, the latter largely consisting of allochthonous species, mainly from vegetated bottoms. Allochthony of thanatocoenosis proves to be related to distance from the openings. A largely autochthonous (c. 90%) thanatocoenosis prevails only in the innermost and more sheltered part (site A3, see Fig. 1). Sediment texture also proves to be related to the "confinement degree" (see Bianchi & Morri, 1994), being muddy in the innermost site and sandy in the less confined ones.

The presently described species was found in the A3 site, from where it was listed as "undetermined skeneimorph" by Di Geronimo *et al.* (1997: Table 1). Additional specimens were later sorted from other bottom material from the same site.

Specimens selected for SEM observations were treated with dilute bleach, mounted on stubs and gold-coated. Measurements were taken from SEM pictures.

#### SYSTEMATIC DESCRIPTION

GASTROPODA  
VETIGASTROPODA  
SKENEIDAE

Genus *Skeneoides* Warén, 1992

Type species *Delphinula exilissima* Philippi, 1844 by O.D.

*Skeneoides digeronimoi* n. sp.

Figs 2–13

*Holotype* University Palaeontological Museum, Catania.

*Paratypes* 8 specimens as holotype.

*Type locality* Inside the Accademia Cave, Ustica Island, southern Tyrrhenian Sea, 3–4 m.

*Material examined* Only the type-series, consisting of empty shells.

*Measurements* Holotype 0.93 mm in diameter, 0.74 mm in height.

*Description* Shell very small, skeneimorph, tall-spined, whitish, vitreous, slightly glossy. Protoconch of 1.5 whorls, c. 270  $\mu$ m in diameter, pitted, nucleus slightly distorted. Teleoconch of up to 1.5 whorls rather loosely coiled. Sculpture of strong ringlike axial ribs (c. 30 in the holotype), more and more wide-spaced with growth, weaker to ill-

defined near aperture. A weak to ill-defined dorsal spiral rib, often replaced by a series of weak knobs on axial ribs. A similar series of knobs also present on base. Microsculpture of closely set granules roughly axially aligned. Umbilicus wide and deep. Aperture circular, radial; lip thin.

*Derivation of name* Named for Prof. S.I. Di Geronimo, who introduced me to cave mollusc study.

*Taxonomy* Based on shell morphology, the present species can be allocated in the family Skeneidae, as treated by Hickman & McLean (1990) and Warén (1992; 1993). Shell morphology also supports its position in *Skeneoides* Warén, 1992. This genus was erected to allocate low-spired and strongly sculptured skeneids, which also show anatomical and radular differences from other morphologically similar skeneimorphs (Warén, 1992). Two other species of *Skeneoides* are known from the Mediterranean (Warén, 1992), i.e. *S. exilissima* (Philippi, 1844) and *S. jeffreysi* (Monterosato, 1872). The distorted protoconch nucleus of *S. digeronimoi* (Figs 12, 13) is worth stressing. Warén (1992) remarked this feature for the skeneid genus *Lodderena* Iredale, 1924, but it also appears typical to *Skeneoides* (see *S. exilissima* and *S. jeffreysi* in Warén 1992: Figs 9b, 9c). Also the "axial" granulose microsculpture (Figs 8, 11) is typical for the genus (Warén, 1992). The "lacking" of a spiral sculpture in *S. digeronimoi* should be noted, as "4 to 12 strong spiral ribs" were originally remarked for *Skeneoides*. However, "relicts" of a spiral sculpture can be traced in the present species too.

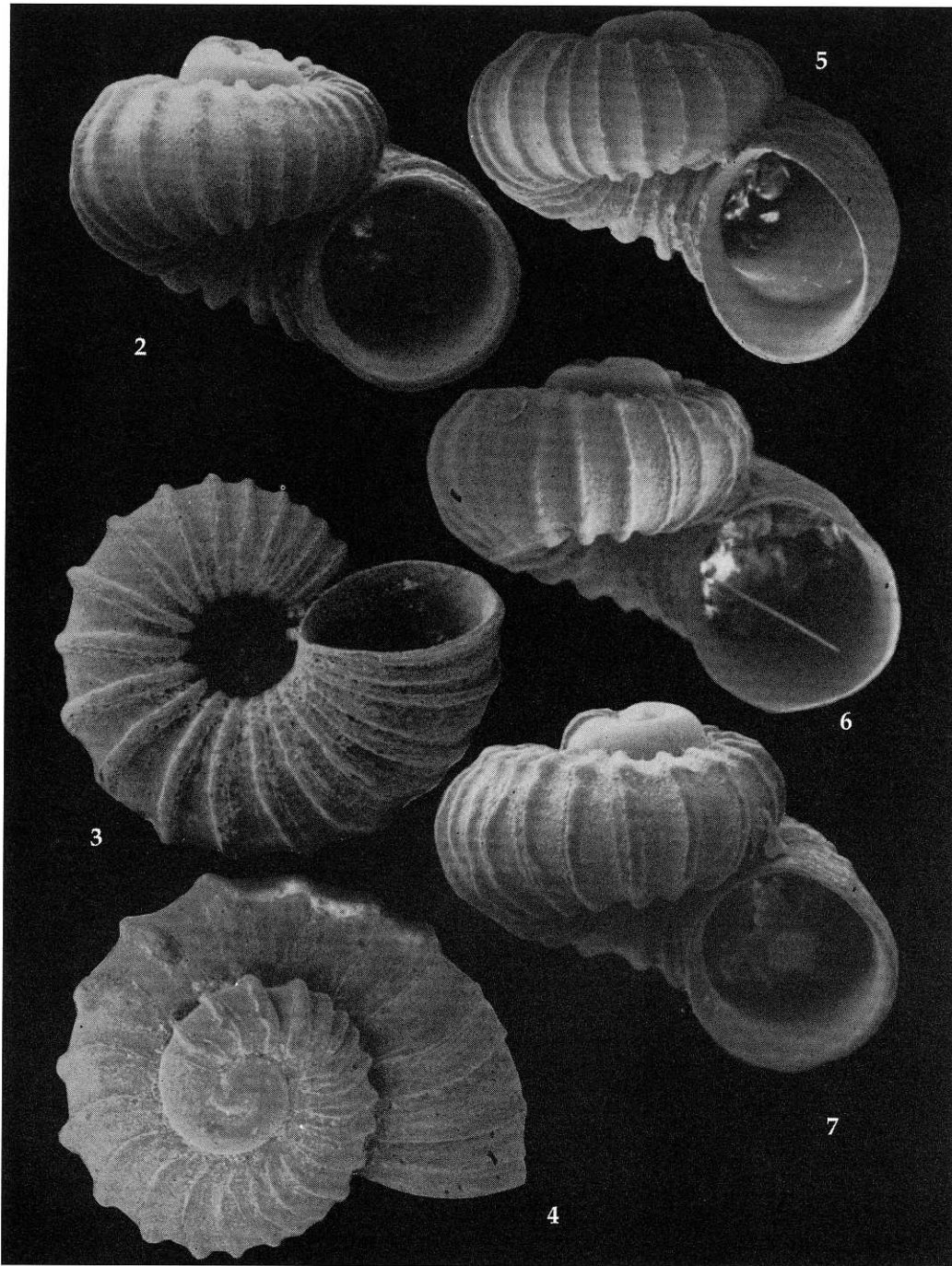
*Geographic range* Only known from the type locality.

*Remarks* The spiral sculpture is poorly developed. A true spiral cord, much fainter than the axial ribs, may be present dorsally throughout the teleoconch or only in the early stage (Fig. 12), or it may be quite lost (Fig. 4). Faint knobs (Figs 2–8), giving an obscurely angulate whorl profile often replace it. Fainter knobs may also develop on the base. The axial ribs prove to be somewhat irregular at SEM, and each often with one or two "secondary" ribs (Figs 8, 10). Ribs may rarely become bifurcate (Fig. 9). Moderate variations in shape also occur (Figs 2–7).

Owing to the strong spiral sculpture, the present species is more similar to *S. jeffreysi* than to *S. exilissima*. The former, anyway, has well-defined spiral ribs throughout the shell, crossing the axial sculpture (where knobs develop) and giving a reticulate appearance. It is also notably flatter (height/diameter *c.* 0.5) than *S. digeronimoi* (h/d 0.7–0.8). Also *S. exilissima* is flatter (h/d *c.* 0.6), the axial sculpture is weaker and a well-defined spiral sculpture, almost equal in strength to the axial one, is present. The protoconch size of *S. digeronimoi* is comparable to that of *S. exilissima* and *S. jeffreysi*.

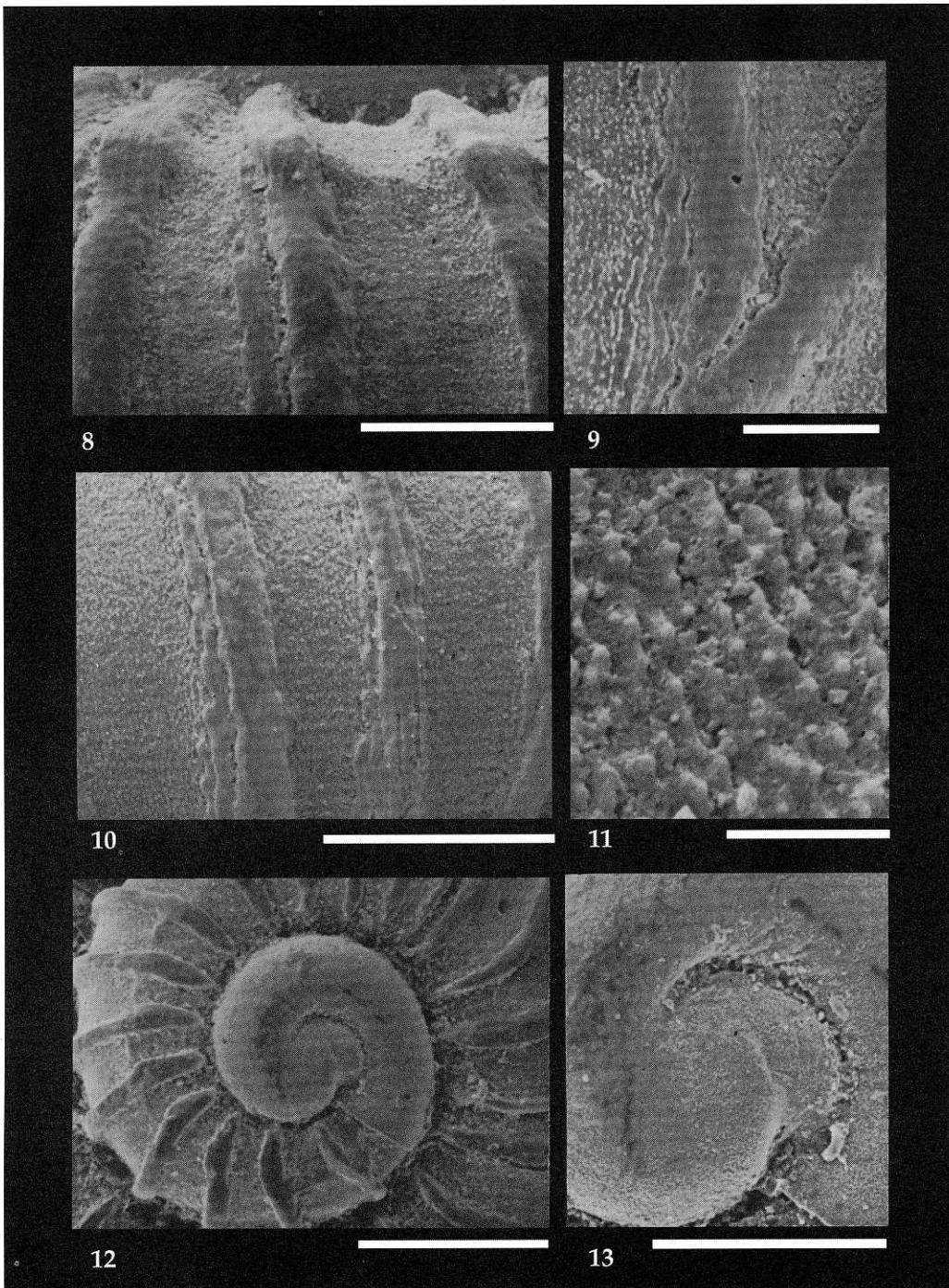
## DISCUSSION

In spite of the small size, which would allow the shells of *S. digeronimoi* to be easily displaced to the innermost cave parts, it seems more likely that this species is an autochthonous element instead. First, it should be noted that the rich tanathocoenoses from the less sheltered sites A1 and A2 did not yield any shells of *S. digeronimoi*. The depauperate bottom tanathocoenosis occurring in the A3 site largely consists of sciaphilous sessile species, clearly coming from the surrounding cave walls. Further evidence of the ecological peculiarity of site A3 is provided by the occurrence of three bivalves, namely *Dacrydium hyalinum*, another paedomorphic mytilid (?= "*Crenella*"



**Figs 2-7** *Skeneoides digeronimoi* n. sp. 2-4 Holotype (diameter 0.93 mm, height 0.74 mm). 5 Paratype (diameter 0.89 mm, height 0.70 mm). 6 Paratype (diameter 0.97 mm, height 0.71 mm). 7 Paratype (diameter 0.94 mm, height 0.73 mm).





**Figs 8–13** *Skeneoides digeronimoi* n. sp. **8** Holotype, sculpture detail. **9** Paratype, sculpture detail. **10** Holotype, sculpture detail. **11** Microsculpture of the same specimen. **12** Paratype, top view and protoconch. **13** Protoconch detail of the same specimen. Scale bars = **8, 10, 13**, 100  $\mu\text{m}$ ; **9**, 50  $\mu\text{m}$ ; **11, 10**  $\mu\text{m}$ ; **12**, 200  $\mu\text{m}$ .

*arenaria* Monterosato, 1875) and the micromorphic *Kelliella abyssicola* (Forbes, 1844) (Di Geronimo *et al.*, 1997). These species can be regarded as a stock of deep-sea affinity and related to the fine-grained bottom. In the same site the paedomorphic brachiopod *Tethyrhynchia mediterranea* Logan, 1994 (known from dark Mediterranean caves; Logan & Zibrowius, 1994) is also common. All this provides a ground to assume *S. digeronimoi* to be an element of the cave community living in the darker and more confined parts. One might anyway expect to find it on a number of substrates outside the caves, such as crevices, coralligenous bottoms and deep-shelf bottoms.

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#### ADDITIONAL

While the present article was in press, Dr Winfried Engl called my attention on *Skenea nilarum* Engl, 1996 (*La Conchilgia*, 280: 21–23), of which I examined some specimens. *S. nilarum* is a shallow-water species from Lanzarote, Canary Islands. It is notably similar to *Skenoides digeronimoi*, from which it differs by being much flatter, with thinner and more raised ribs, and by lacking spiral sculpture. No anatomical data are available. I express my thanks to Dr W. Engl for his kind help.

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