



## Description of *Alvania alicae* spec. nov. (Gastropoda, Rissoidae) from the Mediterranean Sea

## Descripción de *Alvania alicae* spec. nov. (Gastropoda, Rissoidae) del Mar Mediterráneo

Bruno AMATI\*

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### ABSTRACT

A new Mediterranean species of the genus *Alvania* (Rissoidae, Rissooidea) is described: *Alvania alicae* spec. nov. All known specimens come from the type locality, Lampedusa Is. It is compared with the most similar congeners: *Alvania subcrenulata* (Bucquoy, Dautzenberg & Dollfus, 1884), *Alvania amatii* Oliverio, 1986, *Alvania nestaresi* Oliverio & Amati, 1990 and *Alvania balearica* Oliver & Templado, 2009. Additionally, a lectotype of *Rissoa bicingulata* G. Seguenza, 1876 is hereby designated to stabilize its use.

### RESUMEN

Se describe una nueva especie Mediterránea del género *Alvania* (Rissoidae, Rissooidea): *Alvania alicae* spec. nov. Todos los ejemplares conocidos provienen de la localidad tipo, Lampedusa. Se compara con las especies congénéricas más similares: *Alvania subcrenulata* (Bucquoy, Dautzenberg y Dollfus, 1884), *Alvania amatii* Oliverio, 1986, *Alvania nestaresi* Oliverio y Amati, 1990 y *Alvania balearica* Oliver y Templado, 2009. Además, se designa un lectotipo de *Rissoa bicingulata* G. Seguenza, 1876 para estabilizar su uso.

### INTRODUCTION

The genus *Alvania* s.s. Risso, 1826 has particularly radiated in the Mediterranean Sea, with over 70 species (CLEMAM database: Gofas & Le Renard 2014; WoRMS database: Gofas, 2014) and includes several species-complexes (e.g. *Alvania lineata* Risso, 1826, *Alvania scabra* (Philippi, 1844) and *Alvania subcrenulata* (Bucquoy, Dautzenberg & Dollfus, 1884), with wide geographic ranges and non-planktotrophic development. A population of the *Alvania subcrenulata*-complex from Lampedusa Island (southern Mediterranean Sea) proved morphologically distinct from all other known members

and is here described as new (*Alvania alicae* spec. nov.), and compared with the most similar known species from the Mediterranean Sea.

#### Abbreviations and acronyms

BAC: Bruno Amati collection (Rome); INC: Italo Nofroni collection (Rome); MOC: Marco Oliverio collection (Rome); JTC: José Templado collection (Madrid); CSC: Carlo Smriglio collection (Rome); MCZR: Zoological Museum, Rome; IRSN: Royal Institute of Natural Sciences, Brussels; MNCN: Museo Nacional de Ciencias Naturales, Madrid; MNHN: Muséum National

\* Largo Giuseppe Veratti, 37/D, 00146 Rome, Italy; E-mail: bruno.amati1955@libero.it

d'Histoire Naturelle, Paris, SEM: scanning electron microscope.  
sh – shell (s)

### MATERIAL EXAMINED

*A. alicae* spec. nov. (see below for the detail of material examined): 46 sh (31 ad. + 15 juv.); *A. amatii* Oliverio 1986: holotype and 5 paratypes (MCZR), 20 paratypes (MOC), 5 paratypes (BAC); *A. nestaresi* Oliverio & Amati, 1990: holotype and 5 paratypes (MCZR), 15 paratypes (MOC), 15 paratypes (BAC); *A. subcrenulata* (Bucquoy, Dautzenberg & Dollfus, 1884): the lectotype (Fig. 3, A-D), ex

Dautzenberg collection (MNHN n° 24812), designated by OLIVERIO & AMATI (1990: fig: 4a), 1 sh, probable syntype (now paralectotype), St. Raphael, France, Dautzenberg collection (IRSN, Brussel) (OLIVERIO & AMATI, 1990: 85, pl. I, fig. 2), 13 sh, probable syntypes (now paralectotypes), Cannes, France, Monterosato collection ex Dautzenberg, (MCZR, L.10.22134); *Alvania balearica* Templado & Oliver, 2009: 45 sh, topotypes from the Balears (Minorca and Ibiza) and Columbretes, 10-40 m depth (JTC). 1 syntype (herein designated as lectotype) *Rissoa bicingulata* G. Seguenza, 1876 Messina, Sicily, Monterosato collection ex G. Seguenza (MCZR, L.10.22067).

### SYSTEMATICS

Superorder CAENOGASTROPODA Cox, 1960  
Superfamily RISSOIDEA Gray, 1847  
Family RISSOIDAE Gray, 1847  
Genus *Alvania* Risso, 1826

Type-species: *Alvania europea* Risso, 1826: 142, pl. IX, fig. 116 = *Alvania cimex* (Linnaeus, 1758) (*Turbo*), by subsequent designation Nevill, 1885: 105.

*Alvania alicae* spec. nov. (Fig. 1, A-C; Fig. 2, A-D)

**Type material and type locality:** Holotype (MNHN IM-2000-27248): Cala Calandra 30 m depth, Lampedusa Island, Italy, Marco Oliverio legit 30.iv.1991; H. 2.65 mm, W. 1.6 mm (Fig. 2, A-D). Paratypes: 1 sh (type locality) (MNCN 15.05/60121); 1 sh (type locality) (MCZR 0228 cabinet of typical material); 5 sh (type locality) (INC); 5 sh (type locality) (MOC); 5 sh (type locality) (BAC); 1 sh (type locality) (CSC).

**Other material examined:** 7 sh (1 ad. + 6 juv.) from the type locality, M. Oliverio legit (INC); 6 sh (5 ad. + 1 juv.) Cala Calandra 2-5 m depth, Lampedusa Island, G. Buzzurro legit viii.1986 (INC); 4 sh (3 ad. + 1 juv.) Lampedusa Island 25-27 m depth, M. Oliverio legit 1992 (INC); 3 sh (2 ad. + 1 juv.) from the type locality, M. Oliverio legit (MOC); 7 sh (1 ad. + 6 juv.) from the type locality, M. Oliverio legit (BAC).

**Etymology:** After the wonderful little woman Alice Fioriti, granddaughter of the author.

*Description (between parentheses data of the holotype):* Shell small, height 2.05-2.80 (2.65) mm, width 1.30-1.60 (1.60) mm, solid, ovate-conical.

Protoconch (Fig. 2, B-C) paucispiral, with moderately twisted nucleus, consisting of 1.25-1.30 (1.25) whorls, 0.30-0.35 (0.30) mm high; diameter of nucleus (d) 0.10-0.12 (0.12) mm, diameter of the first half whorl (Do) 0.20-0.25 (0.25) mm, maximum diameter (DM)

0.35-0.40 (0.40) mm. Sculpture of 6-7 (6) equidistant spiral cords, frequently interrupted toward the end of the protoconch (Fig. 2, B).

Teleoconch of 3.1-4.0 (3.8) convex whorls, with impressed suture. Axial sculpture of 13-15 (13) orthocline ribs on the last whorl, smaller than the interspaces. Spiral sculpture of 7-8 (8) non-equidistant cords on the last whorl, of which 4 (4) on the base. Cords II and IV

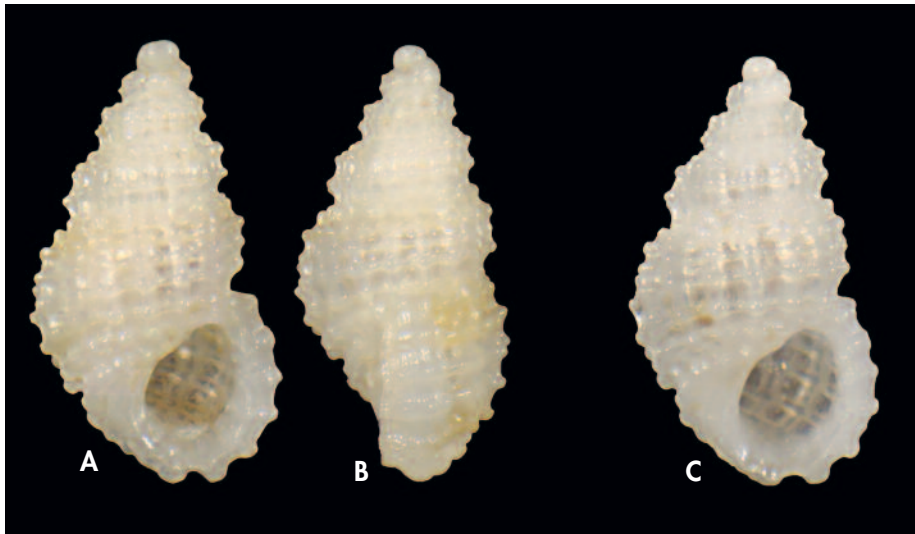


Figure 1. *Alvania alicee* spec. nov. from the type locality Cala Calandra 30 m depth, Lampedusa Island, Italy. A, B: paratype, height 2.75 mm (INC); C: paratype, height 2.65 mm (BAC).

Figura 1. *Alvania alicee* spec. nov. de la localidad tipo Cala Calandra, profundidad 30 m, isla de Lampedusa Italia. A, B: paratipo, altura 2,75 mm (INC); C: paratipo, altura 2,65 mm (BAC).

starting after the metamorphosis; cord I starting as a keel after 2 whorl, rapidly yet gradually turning into a cord; cord III appearing at 2-4 whorls (Table I). Rounded and elevated tubercles formed at the intersection of ribs and cords, somewhat spinulose in fresh specimens; interspaces square in the first whorls, rectangular in the last one. Microsculpture absent, except for growth lines (Fig. 2, D). Umbilical chink absent. Aperture small, 0.95-1.20 (1.1) mm high, ovate rounded, thickened by a strong external varix and internally crossed by seven (7) elongated teeth. Colour white, with light brown spiral bands in particularly fresh specimens. Operculum and soft parts unknown.

*Distribution:* So far known only from the type locality in Lampedusa Island. The bioclastic sand where the shells were found, was sampled in the intermatte of a *Posidonia oceanica* meadow and it can be hypothesized that it lives in that habitat. *A. subcrenulata* (Bucquoy, Dautzenberg & Dollfus, 1884), which elsewhere occurs in deeper habitats (Templado in OLIVERIO & AMATI, 1990;

GOFAS, MORENO & SALAS, 2011; CONTI & ROSSINI, 1985; BOGI, COPPINI & MARGELLI, 1983) has been collected in the same samples. However, *A. subcrenulata* is considered as having a wide bathymetric range (from intertidal down to 40/45 m: SCAPEROTTA, BARTOLINI & BOGI, 2012).

For the distribution of *Acinus bicingulatus* in the sense of L. SEGUENZA (1903), see Remarks.

*Remarks:* The species of the *Alvania subcrenulata*-complex: *Alvania subcrenulata* (Bucquoy, Dautzenberg & Dollfus, 1884), *Alvania amatii* Oliverio, 1986, *Alvania nestaresi* Oliverio & Amati, 1990, *Alvania balearica* Oliver & Templado, 2009 and *Alvania alicee* show a teleoconch spiral sculpture starting with two equidistant cords (II and IV), to which subsequently two intermediate cords are added (I and III), and a total of 8-9 spiral cords are visible on the entire body-whorl. The additional cords start in different ways in the various species. In *Alvania nestaresi* cord I is first formed, followed by III. In *Alvania subcrenulata* and in *Alvania amatii* cord III is first

Table I. Characters of the teleoconch in Mediterranean species of the *Alvania subcrenulata*-complex. Measurements in mm. H - height; W- width; Ha - height of the aperture; Nw - number of whorls; Nar - number of axial ribs; Nsc-ab - number of spiral cords above the aperture; Ncs-ba - number of spiral cords on the base; Gen - genesis of the III and I spiral cord.

Tabla I. Caracteres de la teleoconcha en especies mediterráneas del complejo de *Alvania subcrenulata*. Dimensiones en mm. H - altura; W- anchura; Ha - altura de la abertura; Nw - número de vueltas; Nar - número de costillas axiales; Nsc-ab - número de cordones espirales por encima de la abertura; Ncs-ba - número de cordones espirales en la base; Gen - genesis de los cordones espirales III y I.

Teleoconch	<i>A. subcrenulata</i>	<i>A. amatii</i>	<i>A. nestaresi</i>	<i>A. balearica</i>	<i>A. aliciae</i>
H	2.45-3	1.8-2.5	1.85-2.9	1.6-2.5	2.05-2.8
W	1.6-1.85	1.2-1.55	1.3-1.85	1.07-1.5	1.3-1.6
Ha	1.2-1.45	0.9-1.0	0.7-1.45	0.75-1.1	0.95-1.2
Nw	3.1-3.7	2.7-3.5	2.7-3.7	2.5-3.7	3.1-4.0
Colouration	White with or without brownish bands	White with or without brownish bands	Whitish with or without brownish bands	White with or without brownish bands	White with or without brownish bands
Profile	Ovate-conical, with rather wide base	Ovate-conical tending to cylindrical	Ovate-conical tending to globular	Ovate-conical tending to turriculated	Ovate-conical, with moderate basal diameter tending to triangular
Nar	13-14 + v	14-17 + v	14-19 + v	11-16 + v	13-15 + v
Nsc-ab	3-4	3-4	4	2-3 (4)	3-4
Ncs-ba	4	4	4-5	4	4
Start of III spiral cord	1.2-1.8 whorls	1.3-1.7 whorls	1.5-2.1 whorls	1.5-2.2 whorls	1.8-3 whorls
Start of I spiral cord	1.8-3 whorls	2-3 whorls	1-1.5 whorls	Only on the varix or absent	1.5-2.6 whorls
Tubercles	Medium sized, from slightly to very pronounced	Medium sized, slightly pronounced	Large sized, rounded and slightly pronounced	Medium sized, very pronounced	Small sized, prominent, almost spiny

formed. In *Alvania aliciae* cords I and III are formed almost simultaneously. In *Alvania balearica* cord III is first formed after 1.5-2.2 whorls, and cord I is visible only on the apertural varix, rarely a little before, occasionally it is absent (Table I).

*Alvania nestaresi* (Fig. 5, A) (OLIVERIO & AMATI, 1990: 85, pl. I, II, figs. 1, 6-7; OLIVER & TEMPLADO, 2009:59, 63, figs.10-11, 30; GOFAS, MORENO & SALAS, 2011: 180, 3 unnumbered figs.; SCAPERROTTA, BARTOLINI & BOGI, 2012: 51, 5 unnumbered figs.) differs from *Alvania aliciae* in the more robust and inflated shell, with a higher aperture (h. 1.45 mm v. h. 1.20 mm in *Alvania aliciae*). The tubercles at the intersection of axial and spiral sculptures are broader and less evident, with more axials on the last whorl (14-19 v. 13-15 in

*Alvania aliciae*); there are always 4 spirals above the aperture, equidistant and of similar strength, v. the 3-4 of *Alvania aliciae* (Table I). The protoconch of *Alvania nestaresi* is lower (h. 0.25-0.30 mm v. h. 0.30-0.35 mm in *Alvania aliciae*), wider (max diameter 0.32-0.37 mm v. 0.35-0.40 mm), and has 6 spiral cordlets (v. 6-7 in *Alvania aliciae*), which tend to disaggregate in the last 0.25 whorls (Table II). The colour is always whitish or with brown spiral bands. *A. nestaresi* lives in the cavities of the calcareous alga *Mesophyllum alternans*, in the *Posidonia oceanica* meadows of Almería (GOFAS, MORENO & SALAS, 2011; OLIVERIO & AMATI, 1990:88).

*Alvania amatii* (Fig. 5, D-E) (OLIVERIO, 1986:33-34, figs. 1-4; OLIVERIO & AMATI, 1990:85, pl. I, fig. 5; SCAPERROTTA, BAR-

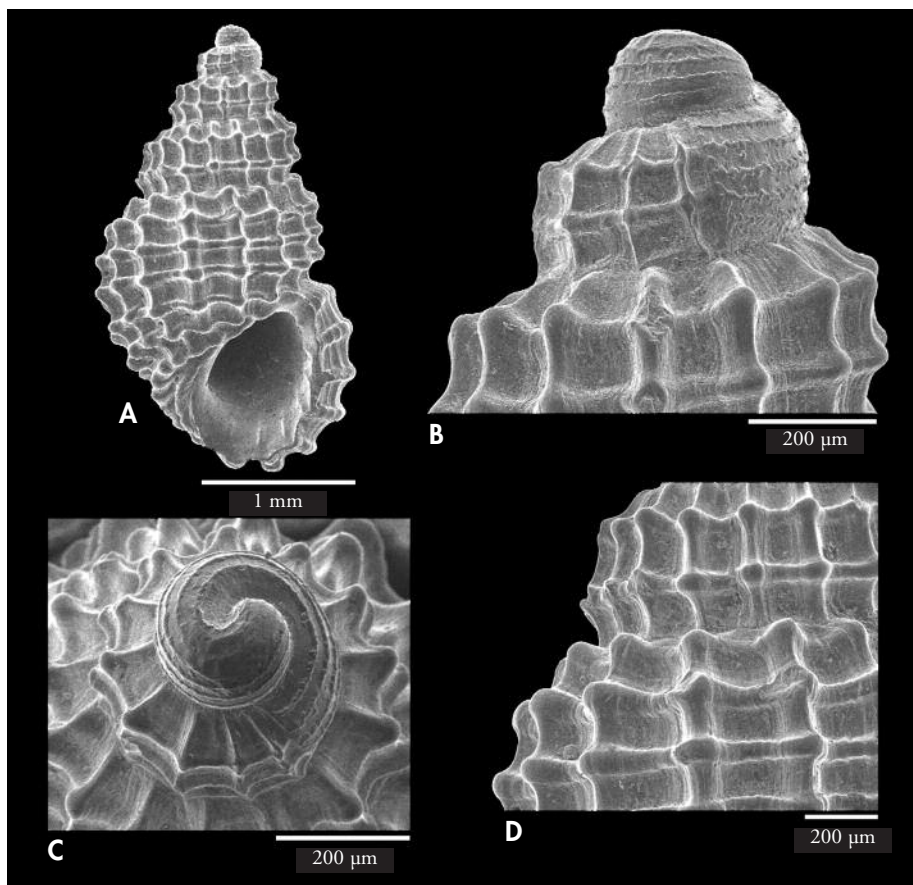


Figure 2. *Alvania aliceeae* spec. nov. A-D: holotype, height 2.65 mm, Cala Calandra 30 m depth, Lampedusa Island, Italy (MNHN); B, C: protoconch; D: detail of the teleoconch.

Figura 2. *Alvania aliceeae* spec. nov. A-D: holotipo, altura 2,65 mm, Cala Calandra, profundidad 30 m, isla de Lampedusa, Italia (MNHN); B, C: protoconcha; D: detalle de la teleoconcha.

Table II. Characters of the protoconch in Mediterranean species of the *Alvania subcrenulata*-complex. Measurements in mm. h – height; d – diameter of nucleus; Do – diameter of first half whorl; DM – maximum diameter; nw – number of whorls

Tabla II. Caracteres de la protoconcha en especies mediterráneas del complejo de *Alvania subcrenulata*. Dimensiones en mm. h – altura; d – diámetro del núcleo; Do – diámetro de la primera media vuelta; DM – diámetro máximo; nw – número de vueltas.

Species	h	d	Do	DM	nw	Sculpture
<i>A. subcrenulata</i>	0.27-0.38	0.10-0.14	0.20-0.22	0.32-0.38	1.2-1.4	apical keel with tubercles
<i>A. amatii</i>	0.30-0.32	0.10-0.12	0.23-0.25	0.35-0.40	1-1.3	4-5 spiral cords
<i>A. nestaresi</i>	0.25-0.30	0.10-0.15	0.20-0.25	0.32-0.37	1.1-1.2	6 spiral cords
<i>A. balearica</i>	0.30-0.35	0.06-0.10	0.20-0.25	0.325-0.375	1.2-1.4	3 principal spiral cords
<i>A. aliceeae</i>	0.30-0.35	0.10-0.12	0.20-0.25	0.35-0.40	1.25-1.3	6-7 spiral cords



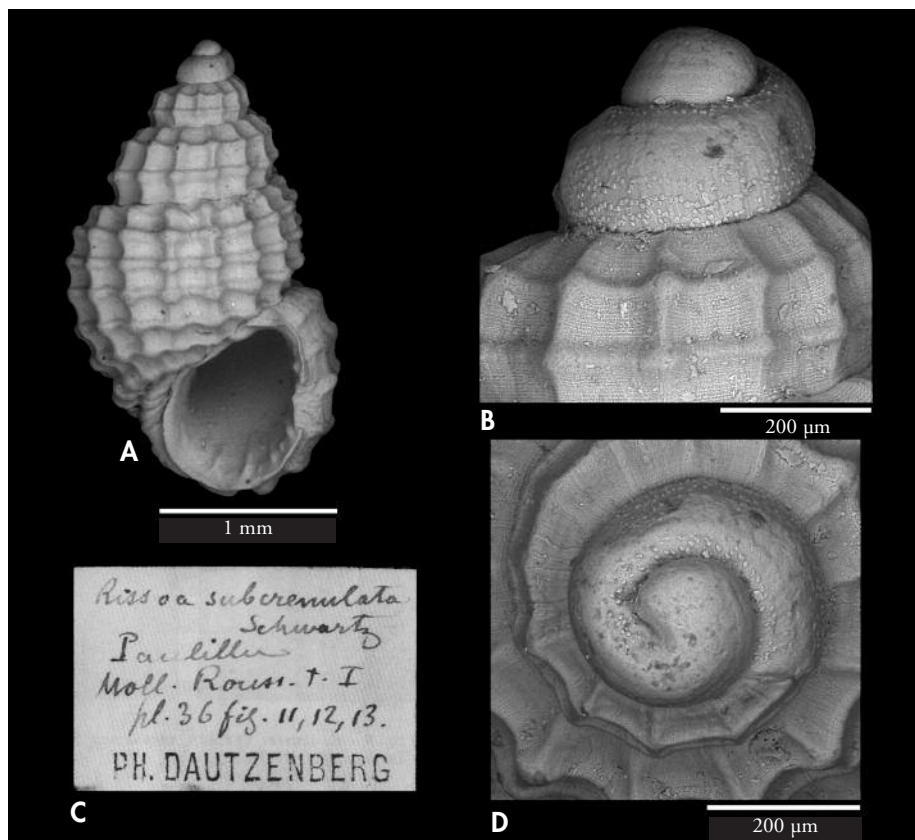


Figure 3. *Alvania subcrenulata* (Bucquoy, Dautzenberg and Dollfus, 1884) A-D: lectotype, height 2.6 mm, Paulilles, France; B, D: protoconch; C: original label (MNHN).

Figura 3. *Alvania subcrenulata* (Bucquoy, Dautzenberg y Dollfus, 1884) A-D: lectotipo, altura 2,6 mm, Paulilles, Francia; B, D: protoconcha; C: etiqueta original (MNHN).

TOLINI & BOGI, 2012: 42, 5 unnumbered figs.) differs from *Alvania alicae* in the more cylindrical outline, with a proportionally higher aperture, and a less marked sculpture (Table I). The protoconch is on average shorter (1-1.3 whorls v. 1.25-1.30 in *A. alicae*), with 4-5 spiral cordlets v. 6-7 in *A. alicae* (Table II).

*Alvania subcrenulata* (Fig. 3, A-D and Fig. 4, A-B) (OLIVERIO & AMATI, 1990: 85, 87, figs. 2, 4, 8; OLIVER & TEMPLADO, 2009:58, figs. 8-9, 29; GOFAS, MORENO & SALAS, 2011:180, 2 unnumbered figs.; SCAFERROTTA, BARTOLINI & BOGI, 2012: 56, 5 unnumbered figs.) differs from *Alvania alicae* in the broader and more regularly oval outline, with a higher

aperture (h. 1.20-1.45 mm v. h. 0.95-1.20 mm in *Alvania alicae*). The sculpture is less 'echinate' and denser (Table I). The protoconch of *A. subcrenulata* has a spiral keel running just beneath the suture, starting after the nucleus and ending a little before the protoconch/teleoconch boundary, and a sculpture of sparse granules (Table II).

*Alvania balearica* (Fig. 5, B-C) (OLIVER & TEMPLADO, 2009:58, figs. 1-7, 28) differs from *Alvania alicae* in the more convex whorls with a turruculated outline (Table I) and in the different apical sculpture (Table II).

Luigi SEGUENZA (1903) while redescribing his father's *Rissoa bicingu-*

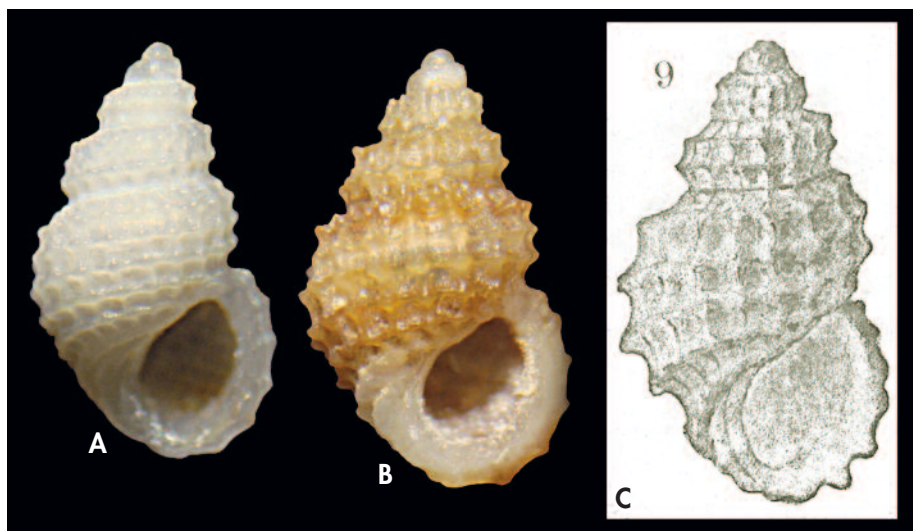


Figure 4. *Alvania* spp. A: *Alvania subcrenulata* (B.D.D., 1884), Lampedusa Island, Italy, height 2.25 mm (BAC); B: *Alvania subcrenulata* (B.D.D., 1884), Salina Island, Isole Eolie, Italy, height 2.45 mm (BAC); C: *Acinus bicingulatus*, original figure in L. SEGUENZA 1903: fig. 9.

Figura 4. *Alvania* spp. A: *Alvania subcrenulata* (B.D.D., 1884), isola de Lampedusa, Italia, altura. 2,25 mm (BAC); B: *Alvania subcrenulata* (B.D.D., 1884), isola Salina, Isole Eolie, Italia, altura 2,45 mm (BAC); C: *Acinus bicingulatus*, figura original en L. SEGUENZA 1903: fig. 9.

*lata* G. Seguenza, 1876, actually misidentified it and described (as *Acinus bicingulatus*) a species of the *A. subcrenulata*-complex, one of the several mistakes made by L. SEGUENZA (1903) (unpublished observations). Regardless of whether *Acinus bicingulatus* L. Seguenza, 1903 (Fig. 4, C) is considered as a mere misidentification with no nomenclatural value, or as an introduction of a new taxon, *Alvania bicingulata* (L. Seguenza, 1903) would be a junior secondary homonym of *Alvania bicingulata* (G. Seguenza, 1876) and cannot be the valid name of any species. The species dealt with by L. SEGUENZA (1903) is very similar to *A. alicae*, in particular with its spinose tubercles at the intersection of the spiral and axial sculpture. However, according to the only available illustration (L. SEGUENZA, 1903: 64[12] pl. XI [I], fig. 9) and based on the relative strength of the teleoconch spirals in the original figure, it seems that the II and III spirals are first formed (and not the II and IV as in the

other species of the complex, including *A. alicae*).

*Alvania bicingulata* (G. Seguenza, 1876) is a Pliocene species, likely extinct, of the *A. dictyophora*-complex (PALAZZI & VILLARI, 2001: 14,15, 36-37, figs. 22-31, 33-51). The original localities reported for *Rissoa bicingulata*: ["Fossile colla precedente... (*R. tenuicostata* Seguenza)... del plioceno superiore di Messina..." (G. SEGUENZA, 1876a: 63) and "E' notevole che in questa fauna esistano talune specie che erano state da me raccolte nel plioceno Messinese e Reggiano e non ancora conosciute viventi." (G. SEGUENZA, 1876b:1)], indicate the inclusion of both Recent and fossil materials. However, I do not know this species from the Recent Mediterranean fauna. In the Monterosato collection (MCZR, L.10.22067) there is a lot containing a fossil specimen (Fig. 5, F-G) of *Rissoa bicingulata* G. Seguenza, 1876 from Messina (ex coll. G. Seguenza), concordant with the present interpretation, which is here designated as lectotype, and stabilizes the use of this name.

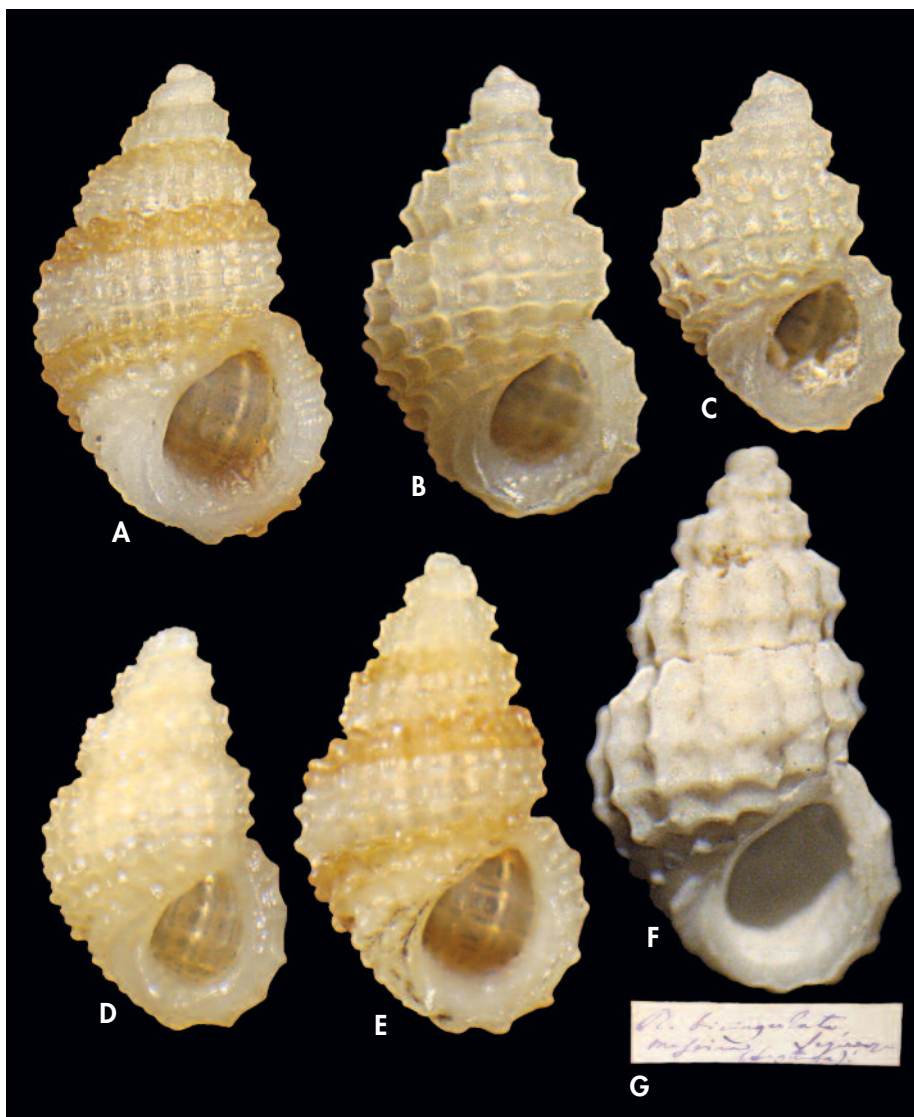


Figure 5. *Alvania* spp. A: *Alvania nestaresi* Oliverio and Amati, 1990, paratype, Almuñécar, Granada, Spain, height 2.8 mm (BAC); B,C: *Alvania balearica* Oliver and Templado, 2009, Ibiza, Spain, height 2.25 mm (B) and 1.62 mm (C) (JTC); D: *Alvania amatii* Oliverio, 1986, paratype, Datça, Turkey, height 2.1 mm (BAC); E: *Alvania amatii* Oliverio, 1986, Scilla, Italy, height 2.7 mm (INC); F: *Rissoa bicingulata* G. Seguenza, 1876, lectotype, Messina, Sicily, height 3.35 mm (MCZR); G: *Rissoa bicingulata* G. Seguenza, 1876, original labels in Monterosato's collection (MCZR).

Figure 5. *Alvania* spp. A: *Alvania nestaresi* Oliverio y Amati, 1990, paratipo, Almuñécar, Granada, España, altura 2,8 mm (BAC); B,C: *Alvania balearica* Oliver y Templado, 2009, Ibiza, España, altura 2,25 mm (B) y 1.62 mm (C) (JTC); D: *Alvania amatii* Oliverio, 1986, paratipo, Datça, Turquía, altura 2,1 mm (BAC); E: *Alvania amatii* Oliverio, 1986, Scilla, Italia, altura 2,7 mm (INC); F: *Rissoa bicingulata* G. Seguenza, 1876, lectotipo, Messina, Sicilia, altura 3,35 mm (MCZR); G: *Rissoa bicingulata* G. Seguenza, 1876,etiqueta original en la colección de Monterosato (MCZR).



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