

# The Recent Rissoidae of the Mediterranean Sea. Notes on the genus *Onoba* s.s. H. Adams et A. Adams, 1852 (Gastropoda Prosobranchia)

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## ABSTRACT

The Mediterranean species belonging to the genus *Onoba* H. Adams et A. Adams, 1852 as currently conceived, are reviewed. With the exception of *O. semicostata* (Montagu, 1803) and *O. aculeus* (Gould, 1841) that range mostly in the European North-Eastern Atlantic and are rarely found in the Western Mediterranean, this genus is represented by six species with rather limited ranges: *O. dimassai* Amati et Nofroni, 1991; *O. josae* Moolenbeek et Hoenselaar, 1987; *O. guzmani* Hoenselaar et Moolenbeek, 1987; *O. tarifensis* Hoenselaar et Moolenbeek, 1987; *O. gianninii* (Nordsieck, 1974) and *O. oliverioi* Smriglio et Mariottini, 2000. A further possibly undescribed species is figured. For all species comparative morphometrics are provided. *Onoba josae* Moolenbeek et Hoenselaar, 1987 is here recorded for the first time in Italy, with the easternmost locality in this range.

## KEY WORDS

taxonomy; Rissoidae; *Onoba*; Recent; Mediterranean Sea; first record.

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## INTRODUCTION

The genus *Onoba* H. Adams et A. Adams, 1852 has been frequently discussed in the malacological literature (e.g. H. & A. Adams, 1852: 358; Jeffreys, 1867: 37; Watson, 1873: 387; Verril, 1884: 182; Friele, 1886: 28; Dautzenberg, 1889: 52; Warén, 1973: 4; Warén, 1974: 130; Rolán, 1983: 139; Ponder, 1985: 54; Templado & Rolán, 1986: 117; Bouchet & Warén, 1993: 659; Ponder & Worsfold, 1994: 26; Rolán, 2008: 233; Nekhaev et al., 2014: 269) and has a global distribution, ranging in both hemispheres from the poles to at least the subtropics (Ponder, 1985: 55; Rolán, 2008: 233; Avila et al., 2012: 4).

It is currently subdivided into some few subgenera: *Onoba* (type species *Turbo striatus* J. Adams, 1797), *Ovirissoa* Hedley, 1916 (type species *Rissoa adarensis* Smith, 1902), *Subestea* Cotton, 1944 (type species *Alvania seminodosa* May, 1915) and *Manawatawhia* Powell, 1937 (type species *M. analoga* Powell, 1937).

Seven central-western Mediterranean species, most of which have been described during the last forty years, are currently ascribed to the nominal subgenus (Rolán, 1983: 139; Aartsen et al., 1984: 20; Templado & Rolán, 1986: 117; Oliverio et al., 1986: 35; Moolenbeek & Hoenselaar, 1987: 153; Hoenselaar & Moolenbeek, 1987: 17; Amati & Nofroni, 1991: 30; Smriglio & Mariottini, 2000: 15;

Giannuzzi-Savelli et al., 2002: 80; Rolán, 2008: 233; Gofas et al., 2011: 193; Avila et al., 2012: 5; Bouchet, 2014); these species are: *Onoba semicostata* (Montagu, 1803), *O. gianninii* (Nordsieck, 1974), *O. tarifensis* Hoenselaar et Moolenbeek, 1987, *O. guzmani* Hoenselaar et Moolenbeek, 1987, *O. josae* Moolenbeek et Hoenselaar, 1987, *O. dimassai* Amati et Nofroni, 1991 and *O. oliverioi* Smriglio et Mariottini, 2000. Another species, *O. aculeus* (Gould, 1841), geographically ranging typically on both sides of northern Atlantic including Greenland, has been reported only once from the Mediterranean Sea (Giannuzzi-Savelli et al., 2002: 80).

The missing of new further records convinced some Authors to exclude this species from the main Mediterranean check-lists (Rolán, 2008: 241; Nekhaev et al., 2014: 272). A further possibly undescribed species has been recorded (*Onoba* sp.: Amati & Nofroni, 1991: 34), but never formally named. The anatomy of the genus *Onoba* has been studied by Ponder (1985: 56). Here we utilize the only shell morphology for the description and comparisons of the Mediterranean species. The most important iconographic references are reported for each species.

ABBREVIATIONS AND ACRONYMS. BA: Bruno Amati collection, Rome, Italy. CS: Carlo Smriglio collection, Rome, Italy. IN: Italo Nofroni collection, Rome, Italy. lv: live collected specimen. MCZR: Museo Civico di Zoologia, Rome, Italy. MNHN: Muséum National d'Histoire Naturelle, Paris, France. MO: Marco Oliverio collection, Rome, Italy. MZB: 'Museo di Zoologia' of the University of Bologna, Italy. PM: Paolo Mariottini collection, Rome, Italy. RAMM: Exeter's Royal Albert Memorial Museum & Art Gallery, Exeter, Devon, UK. SB-MS: Stefano Bartolini-Maria Scaperotta collection, Florence, Italy. SEM: Scanning Electron Microscope. sh: empty shell. v.: versus. ZMA: Zoological Museum, Amsterdam, The Netherlands.

## SYSTEMATICS

Family Rissoidae Gray, 1847: 152 (as *Rissoaina*)  
Genus *Onoba* H. Adams et A. Adams, 1852: 358  
Type-species: *Turbo striatus* J. Adams, 1797 non Da Costa, 1778 = *Onoba semicostata* (Montagu, 1803: 326 (by monotypy))

MORPHOLOGY. Diagnosis shell of genus *Onoba* (from Ponder, 1985: 54): "Shell: minute to small,

ovate-conic to elongate-ovate, non-umbilicate to narrowly umbilicate, smooth or with weak to strong spiral sculpture, with a few spiral keels. Axial sculpture usually rather weak to very weak; sometimes axial ribs present but do not extend over base; sculpture rarely clathrate. Aperture with simple peristome, oval, weakly angled and channelled posteriorly, simple and rounded anteriorly; outer lip opisthocline, varix weak to heavy. Protoconch dome-shaped, sometimes with 1 or more spiral keels; smooth (Ovirissoa) or with microsculpture of granules, anastomosing or spirally aligned raised threads or, sometimes, wavy, spirally arranged rows of granules. Periostracum very thin to well developed".

Diagnosis shell of subgenus *Onoba*: (from Ponder, 1985: 56): "Shell: broadly ovate-conic to elongate ovate, rather solid, non-umbilicate, usually with many well developed spiral cords and, sometimes, weak axial ribs; microsculpture of fine spiral lirae usually present. Strong spiral cords in a few species and, in some species, surface smooth. Aperture subcircular; subangled and weakly channelled posteriorly, varix on outer lip strong to moderate. Protoconch domeshaped of about 11/2 whorls in nearly all species, rarely up to 2 2/4 whorls (as in *O. 'semicostata'*); sculptured variously, for example, with exceedingly weak to moderately strong spiral lines with either parallel to oblique wrinkles or granules between, as in *O. aculea* (Gould) and *O. moreleti* Dautzenberg and in Fretter & Graham's (1978) figure of *O. 'semicostata'*; with irregular, raised, wavy threads, as in *O. foveauxiana*. (Suter); with scattered granules, as in *O. fumata*, *O. kermadecensis* (Powell) and several other southern species, as well as *O. n. sp.* from the Eocene of France; (see also Thiriot Quievreux & Babio, 1975; Fretter & Graham, 1978)."

***Onoba semicostata*** (Montagu, 1803) (Figs. 1–6)

*Turbo striatus* J. Adams, 1797: 66 non da Costa, 1778: 86

*Turbo semicostatus* Montagu, 1803: 326, pl. XXI, fig. 5

*Rissoa ecostata* Michaud, 1830 (WoRMS: Bouchet, 2014)

*Rissoa minutissima* Michaud, 1830 (WoRMS: Bouchet, 2014)

*Rissoa peticularis* Menke, 1830 (WoRMS: Bouchet, 2014)

*Onoba candida* (Brown, 1827) (Giannuzzi-Savelli, 2002: 80)

ICONOGRAPHIC REFERENCES. Montagu (1803: 326, pl. XXI, fig. 5); Reeve (1878: pl. V fig. 40 as *Rissoa striata*); Rolán (1983: 139, 140, 3 unnumbered figures as *Onoba aculeus* and 5 unnumbered figures as *Onoba striata*); Rolán (2008: 234, figs. 1-12); Giannuzzi-Savelli et al. (2002: 80, fig. 255 as *Onoba candida* (Brown, 1827)); Nekhaev et al. (2014: 269, figs. 1 A–B, 4 A, D).

TYPE LOCALITY. Atlantic Ocean, south coast of Devonshire, United Kingdom.

TYPE MATERIAL. Not seen. Probable syntypes in Montagu collection (RAMM)

EXAMINED MATERIAL. Norway: Grande, Viken, -100/200 m, 07.1974, 1 sh (BA); Spain: Vigo-Baiona, North-West Atlantic, beached, 08.1982, 1 sh (IN); Vigo Bay (Atlantic) -15 m (legit Palazzi, 1982), 11 juv. sh (IN); Fuengirola, (Malaga) beached (ex coll. Bogi), 1 sh (IN); France: Carteret, Normandy, (Atlantic, 1976), beached, 1 sh (IN); Binard (Atlantic, 1975) among littoral seaweeds, 2 lv (IN); no locality, 1 sh (IN).

ORIGINAL DESCRIPTION. Montagu, 1803: “*T. with a short, conic, white shell, obtusely pointed: volutions four or five, rounded, well defined by the separating line, and wrought with faint ribs, and fine obsolete transverse striae on the body whorl, both of which are inconspicuous on the superior spires: the ribs do not extend to the lower part even of the body, where the spiral transverse striae become most conspicuous: aperture suborbicular; pillar lip a little reflexed, Columella smooth. Length half a line; breadth one half its length. Found in sand on the south coast of Devonshire, but very rare. This at first sight might be confounded with Turbo Spiralis, but differs in the volutions being more rounded, in the ribs being coarser, and in being destitute of the tooth-like plication of the columella.*”

DISTRIBUTION AND HABITAT. Eastern Atlantic, Madera (Ávila et al., 2012), Spain (Rolán, 2008), British Isles (Jeffreys, 1867: 37; Fretter & Graham, 1978), Faroe Islands (Warén, 1996; Sneli et al., 2005), Iceland (Warén, 1996), Norway (Høisæter, 2009). Barents Sea, Kola Peninsula (Golikov & Kussakin, 1978; Nekhaev et al., 2014: 271). Mediterranean Sea (Ávila et al., 2012), Alboran

Sea, Fuengirola (Giannuzzi-Savelli et al., 2002: 80). Common and abundant under rocks and among algae, from the intertidal to -1000 m depth (Templado & Rolán, 1986: 120); common on rocks in -8 m, less common in -80 m, rare under -200 m in the Zelenetskaya Bay, Barents Sea (Nekhaev et al., 2014: 272).

REMARKS. *Onoba semicostata* is the only Mediterranean *Onoba* with a planktotrophic larval development, and is therefore easy to identify (Rolán, 2008: 35, figs. 3–6; Nekhaev et al., 2014: 276, figs. 4 A, D). Shells tend to be curved (var. *distorta* Marshall fide Jeffreys, 1887: 35) and occasionally may have an additional labial varix. Shells collected in the central Mediterranean are probably fossils (Würm). *Onoba aculeus* differs from *O. semicostata* in having a paucispiral protoconch (indicating a non planktotrophic development), a slightly scalariform suture with more convex whorls without subsutural axial ribs. *Onoba breogani* Rolán, 2008, known, at moment, for Galicia (Spain, Atlantic), is very similar to *O. semicostata* in shell morphology, having also subsutural axial ribs, but differs in its paucispiral protoconch.

*Onoba aculeus* (Gould, 1841) (Figs. 7, 8)

*Cingula aculeus* Gould, 1841: 266, fig. 172

*Rissoa saxatilis* Möller, 1842: 9

*Rissoa artica* Lovén, 1846: 156

*Rissoa multilineata* Stimpson, 1851: 14

*Onoba aculeus* (Gould, 1841) (Giannuzzi-Savelli et al., 2002: 80)

ICONOGRAPHIC REFERENCES. Gould, (1841: 172, fig. 172) (not a good picture); Bouchet & Warén (1993: 660, fig. 1507); Delongueville & Scaillet (2001: 12, fig. 10); Giannuzzi-Savelli et al. (2002: 80, fig. 254); Nekhaev et al. (2014: 272, figs. 2 C–D, 4 B, E).

TYPE LOCALITY. East Boston, Massachusetts (USA).

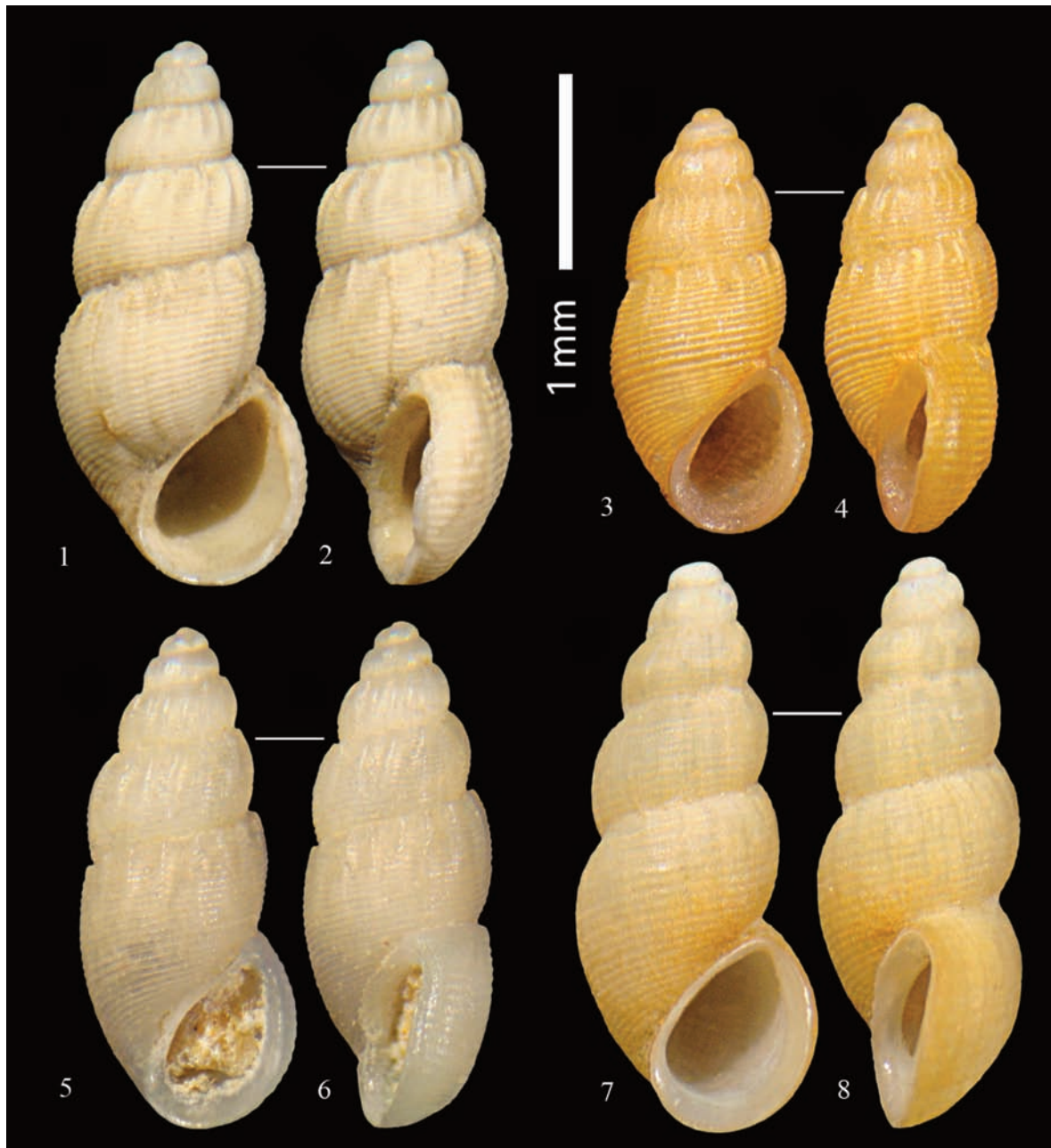
TYPE MATERIAL. Not seen. Originally deposited at the Boston Society of Natural History (BSNH: State Coll., No. 32. Soc. Cab., No. 2359. Gould, 1841: vi, 266).

EXAMINED MATERIAL. Bergen (Norway, Atlantic), -1 m, 2 lv (IN).



ORIGINAL DESCRIPTION. Gould, 1841: “Shell minute, sub-cylindrical; whorls convex, covered with regular, microscopic revolving lines; aperture ovate; umbilicus partial. Shell minute, ovate-cylindrical, elongated, light yellowish horn-color; whorls six, convex, and separated by a deep sutural region; the two upper ones forming a blunt apex,

the lowest rather more than half the length of the shell; the whole covered with regular, crowded, microscopic revolving lines; aperture one third the length of the shell, oval, oblique, angular behind, the margin simple and entire, barely touching the preceding whorl, somewhat expanded, and on the left side elevated, and slightly turned over an



Figures 1–6. *Onoba semicostata* (Montagu, 1803): Figures 1, 2. Grande, Viken (Norway, Atlantic), height 2.9 mm (BA). Figures 3, 4. Binard (France, Atlantic), height 2.3 mm (IN). Figures 5, 6. Fuengirola, (Spain, Mediterranean Sea), height 2.7 mm (IN). Figures 7, 8. *Onoba aculeus* (Gould, 1841), Bergen (Norway, Atlantic), height 3.05 mm (IN).

umbilical depression or chink; operculum horny. Length 3/20 inch, breadth 1/15 inch, divergence 23°. Found sparingly on the partially decayed timbers of an old wharf, and plentifully on stones, about low-water mark, at East Boston.”

DISTRIBUTION AND HABITAT. Western Atlantic (Gould, 1841), Greenland (Møller, 1842; Schiøtte & Waren, 1992), Eastern Atlantic, Faroe Islands (Sneli et al., 2005), Iceland (Ingólfsson, 1996; Waren, 1996), British Isles (Fretter & Graham, 1978), Northern Norway (Høisæter, 2009). Barents Sea, Kola Peninsula and White Sea (Golikov, 1987), Galicia (Templado & Rolán, 1986: 121). Mediterranean Sea, Alboran Sea (Giannuzzi-Savelli et al., 2002: 80). Very common in the Barents Sea in 0-3 m on sandy bottoms (Nekhaev et al., 2014: 272). The species seems to prefer shallow waters with algae, and can tolerate brackish waters (Templado & Rolán, 1986: 121).

REMARKS. The record from Ria de Vigo (Galicia: Templado & Rolán, 1986: 121) is the southernmost occurrence in the Atlantic Ocean, whilst the Alboran Sea record (Giannuzzi-Savelli et al., 2002: 80) should represent the southern limit overall. Shells tend to be curved. *O. aculeus* is very similar to *O. galaica* Rolán, 2008, from Galicia (Spain). Whilst some measurements of teleoconchs (e.g. number of spirals cords on the penultimate and the body whorl) and protoconchs (maximum diameter) are similar in the two species (Rolán, 2008), the different protoconch sculpture (with fine spiral cords in *O. aculeus* and almost smooth in *O. galaica*) (Fretter & Graham, 1978; Warén, 1996; Rolán, 2008) and the less marked teleoconch microsculpture, along with other minor differences (e.g. deeper suture, larger size according to Warén, 1996) allow an easy separation of *O. aculeus* and *O. galaica*. See below under *Onoba semicostata* for the differences from *Onoba aculeus*.

***Onoba dimassai*** Amati et Nofroni, 1991 (Figs. 9–12)

*Onoba dimassai* Amati & Nofroni, 1991: 30, figs. 1–4

ICONOGRAPHIC REFERENCES. Amati & Nofroni (1991: 30, figs. 1–4); Giannuzzi-Savelli et al. (2002: 82, 83, fig. 256)

TYPE LOCALITY. San Felice Circeo, Central Tyrrhenian Sea, Italy -30/50 m.

TYPE MATERIAL. Holotype (MCZR), 9 paratypes (loc. type) (BA), 2 paratypes (type loc.) (IN), 1 paratype (type loc.) (coll. Di Massa, Trieste), 2 paratypes Ventotene Is., Central Tyrrhenian Sea -25 m (MCZR ex coll. Pizzini), 7 paratypes Ventotene Is., Le Sconcioglie Shoal, Central Tyrrhenian Sea, -41 m (MO), 3 paratypes Ponza Is., Central Tyrrhenian Sea, bioclastic sand sample *Posidonia oceanica* -15 m, 04.1979 (coll. A. Lugli, MO), 1 paratype Ponza Is., Central Tyrrhenian Sea, -35 m, 05.1983 (coll. Di Massa TS), 1 paratype S. Stefano Is., Central Tyrrhenian Sea, -40 m (MZCR ex coll. Pizzini), 1 paratype Giannutri Is., Central Tyrrhenian Sea, -27 m (MZCR ex coll. Pizzini), 1 paratype Giglio Is., Central Tyrrhenian Sea, -30 m, 06.1983 (coll. Di Massa, Trieste).

EXAMINED MATERIAL. Type material; Italy: Ponza Is., Central Tyrrhenian Sea, -35 m, 1982-83, 3 sh (BA); Giglio Is., Central Tyrrhenian Sea, -30 m, 05.1983, 1 sh (BA); Ventotene Is., Central Tyrrhenian Sea, -40 m, Summer 2000, 9 sh (BA); 3 sh (topotypes) (BA); Zannone Is., Central Tyrrhenian Sea, -36.5 m, about 60 sh (IN). Egypt: Port Said, 1 sh (IN).

ORIGINAL DESCRIPTION. Amati & Nofroni 1991: “*Conchiglia di piccole dimensioni, ovato-conica, elongata, fragile, semitrasparente, non ombelicata. Protoconca ottusa di 1,20-1,25 giri convessi, lisci; dimensioni: diametro del nucleo mm 0,13-0,18, diametro del primo mezzo giro mm 0,25-0,28; diametro massimo mm 0,30-0,38. Teleoconca di 2-3 giri convessi, separati da una linea di sutura evidente e leggermente canalicolata. Ultimo giro abbastanza ampio, pari a circa i 2/3 dell'altezza totale. Apertura ovale, angolata posteriormente, arrotondata e leggermente svasata anteriormente; labbro ortocline semplice, tagliente, liscio, leggermente inspessito esternamente. Scultura costituita da numerosi cordoncini spirali (24-30 sull'ultimo giro); a forte ingrandimento tutta la superficie, sia i cordoncini che lo spazio tra gli stessi, appare percorsa da strie spirali filiformi. Sono presenti deboli strie di accrescimento ortocline. Colore biancastro, ma gli esemplari più freschi appaiono leggermente giallastri. Opercolo e parti molli sconosciuti: Dimensioni: h. mm 1,40-2,10; d. mm 0,90-1,15; Rapporto d/2h 0,273-0,343.”*

**DISTRIBUTION AND HABITAT.** Central Mediterranean Sea in the infralittoral zone in algal facies -15/50 m, also reported for Port Said (Egypt).

**REMARKS.** *Onoba dimassai* may have occasionally an additional labial varix on teleoconch. Compared to that of *O. dimassai*, the shell of *O. josae* is larger and stronger (H 2.2–3.2 mm v. H 1.4–2.2 mm in *O. dimassai*), deeper suture v. canaliculate in *O. dimassai*; stronger and more spaced spiral sculpture than in *O. dimassai*; outer lip slightly opisthocline v. orthocline in *O. dimassai*; protoconch sculptured with 8 thin and irregular spiral cordlets v. an apparently smooth protoconch (also at SEM) in *O. dimassai*. *Onoba tarifensis* has a more slender shell with a more cylindrical outline and a finer, less incised sculpture, consisting in a higher number of spiral cordlets both on the penultimate and on the body whorl (18–24 and 31–38, respectively v. 8–15 and 18–30 in *O. dimassai*); a protoconch sculptured with 7 thin and irregular spiral cordlets v. an apparently smooth protoconch (also at SEM) in *O. dimassai*. *Onoba gianninii* has a larger shell (H 2.2–2.6 mm v. H 1.4–2.2 mm in *O. dimassai*), is usually collected at greater depths (-93/500 m v. -15/50 m for *O. dimassai*), has a finer teleoconch sculpture, with a higher number of spiral cordlets on the body whorl (30–40 v. 18–30 in *O. dimassai*), and finally differs in having a clear umbilical chink, absent in *O. dimassai*.

***Onoba josae*** Moolenbeek et Hoenselaar, 1987 (Figs. 13–15, 27)

*Onoba moreleti* sensu van Aartsen et al. (1984: 20 fig. 81), not Dautzenberg, 1889

*Onoba josae* Moolenbeek & Hoenselaar (1987: 153 figs. 6–8)

**ICONOGRAPHIC REFERENCES.** van Aartsen et al., 1984: 20, fig. 81; Moolenbeek & Hoenselaar, 1987: 153, figs. 6–8; Giannuzzi-Savelli et al., 2002: 82, 83, figs. 260–261; Gofas et al., 2011: 193, two unnumbered figures; Scaperrotta et al., 2013: 62, five unnumbered figures.

**TYPE LOCALITY.** Getares, Bay of Algeciras, Spain.

**TYPE MATERIAL.** Not seen. Holotype (ZMA Moll. no. 3.87.034), 40 paratypes (ZMA Moll. no. 3.87.035), 40 paratypes (coll. H.J. Hoenselaar), 1 paratype (MNHN of Parigi), 1 paratype (IRScNB),

4 juv. paratypes Spain, Getares, 3 paratypes Getares, 28 paratypes Getares (coll. H.J. Hoenselaar), 19 paratypes Getares (ZMA no. 3.87.036 and coll. H.P.M.G. Menkhorst).

**EXAMINED MATERIAL.** Italy: S. Felice Circeo, Central Tyrrhenian Sea, -30/50 m, 07/1982, 1 sh (BA); Spain: North of Getares (Cadiz - Mediterraneo), legit Gubbioli, 09/1987, 3 sh and 9 fragments, beached (IN); Tarifa -30 m, 1 sh (SB-MS).

**ORIGINAL DESCRIPTION.** Moolenbeek & Hoenselaar, 1987: “*Description of the holotype.* – Length 2.5 mm, width 1.3 mm (fig. 6). Shell oval-conical, semitransparent with some gloss on the surface, umbilicum closed. Protoconch dome-shaped, with about 1 ¼ whorls and with 8 weak and irregular spirals, protruding very little. Teleoconch about 3 ¼ whorls with smooth spiral cords. The interstices are broader than the spiral cords (ratio 1:2) and are covered with 7–8 very fine, somewhat undulating spiral striae. Penultimate whorl with about 9 spiral cords. The upper half of the penultimate whorl with very weak costae. Body whorl somewhat convex, with about 22–24 spiral cords. Aperture subcircular below and rather angular above (angle about 90°), weakly channeled posteriorly. Peristome simple, sharp and continuous. Outer lip clearly opisthocline. Colour white. Operculum, periostracum and soft parts unknown.”

**DISTRIBUTION AND HABITAT.** Strait of Gibraltar, -30 m. One specimen without soft parts from Latal coast (Italy), in bioclastic sediment, -30/50 m.

**REMARKS.** van Aartsen et al. (1984) erroneously identified specimens from Getares (Spain) with *O. moreleti* Dautzenberg, 1889 (Ponder, 1985: 162, figs. 113c, d; Moolenbeek & Hoenselaar, 1987: 155, figs. 1–5), currently considered endemic to the Azores (originally reported as living at great depths, but later collected also in shallower waters: Gofas, 1990: 125). So far, *O. josae* was never reported from outside the area of Gibraltar Strait. The specimen collected in the Central Tyrrhenian and herein reported is the first record from outside that area. The record is based on a single, partly broken and empty adult shell (Fig. 13) so it does not provide information on the local population viability. The shell was sorted out from a sample collected by fishing nets residuals from -30/50 m depth, along with many specimens of *O. dimassai*. *Onoba moreleti* differs from *O. josae* in having a more slender and smaller shell, (1.7–1.9 mm v. 2.2–3.2 in *O. josae*),

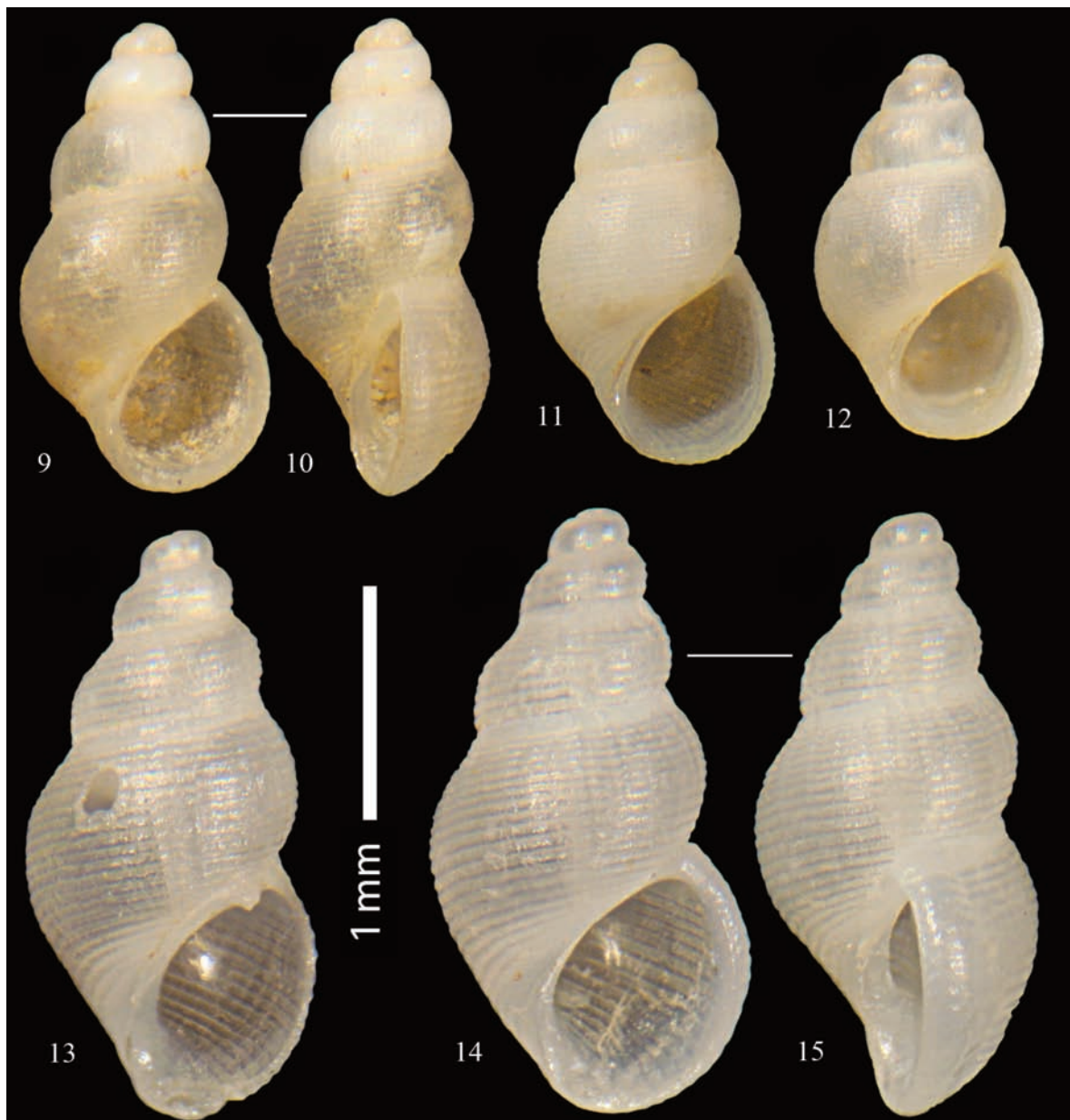


less convex spire, smaller aperture, more or less dark yellowish colour v. white colour in *O. josae*, and a lower number of spiral cordlets both on the penultimate whorl and on the body whorl (respectively 8–9 and 16–17 v. 9–14 and 22–26 in *O. josae*). *Onoba josae* may have thin subsutural axial ribs and, very rarely, an additional labial varix.

*Onoba guzmani* Hoenselaar et Moolenbeek, 1987 (Figs. 21, 22)

*Onoba guzmani* Hoenselaar & Moolenbeek 1987: 19, figs. 7–12

ICONOGRAPHIC REFERENCES. Hoenselaar & Moolenbeek (1987: 19, figs. 7–12); Giannuzzi-



Figures 9–12. *Onoba dimassai* Amati et Nofroni, 1991: Figures 9, 10. San Felice Circeo, Central Tyrrhenian Sea (Italy) paratype, height 2.05 mm (BA). Figure. 11. San Felice Circeo, Central Tyrrhenian Sea (Italy) paratype, height 1.85 mm (BA). Figure. 12. Port Said (Egypt), height 1.7 mm (IN). Figures 13–15. *O. josae* Moolenbeek et Hoenselaar, 1987: Figure. 13. San Felice Circeo, Central Tyrrhenian Sea (Italy), height 2.57 mm (BA). Figures 14, 15. Getares Nord, Cadiz (Spain, Mediterranean Sea), height 2.6 mm (IN).

Savelli et al. (2002: 82, 83, fig. 258); Gofas et al. (2011: 193, 1 unnumbered figure).

TYPE LOCALITY: Tarifa, Spain.

TYPE MATERIAL. Not seen. Holotype (ZMA Moll. no. 3.87.003), 10 paratypes (ZMA Moll. no. 3.87.004), 25 paratypes (coll. Hoenselaar), 3 paratypes, Spain, Tarifa, IV.1985 (ZMA Moll. no. 3.87.005).

EXAMINED MATERIAL. Spain: Getares North, Cadiz (Mediterranean) legit Nofroni, 08/1985, 1 sh, beach (IN); Tarifa -30 m, 1 sh (SB-MS).

ORIGINAL DESCRIPTION. Hoenselaar & Moolenbeek, 1987: "Description of the holotype. - Length 1.8 mm, width 0.80 mm (fig. 7). Shell minute, elongate-conic, non-umbilicate, fragile, semitransparent with some gloss on its surface. Protoconch dome-shaped, 1 ¼ whorls, smooth. Teleoconch with 2 ¾ whorls with microscopical pit-marks more or less forming spirals (fig. 9). Suture deep; whorls concave. On the base 4 shallow spirals (fig. 10). Aperture ovate or drop-shaped, with an opisthoclinal outer lip, varix small or lacking, peristome simple (figs. 10, 12). Operculum, periostracum and soft parts of the animal unknown."

DISTRIBUTION AND HABITAT. Reported for the Strait of Gibraltar and Tangier (Atlantic Morocco) and Tarifa (Spain) -30 m.

REMARKS. *Onoba guzmani* is very similar to *O. lincta* (Watson, 1873), endemic to Madeira (Atlantic) (Watson, 1873: 387), which has a different teleoconch sculpture of fine spiral threads and some strong cords on the base (v. numerous series of microtubercles spirally arranged, and 4 spiral cordlets on the base) and the suture more incised, canaliculated. The protoconch of *O. tarifensis* is sculpted by 7 weak spiral cordlets (v. smooth in *O. guzmani*), a different teleoconch sculpture of 31–38 fine spiral cordlets on the last whorl (v. numerous series of microtubercles spirally arranged, and 4 spiral cordlets on the base) (Hoenselaar & Moolenbeek, 1987, figs 3 and 9) and a stronger labial varix.

***Onoba tarifensis*** Hoenselaar et Moolenbeek, 1987 (Figs. 23, 24)

*Onoba tarifensis* Hoenselaar & Moolenbeek, 1987: 17, figs. 1–6

ICONOGRAPHIC REFERENCES. Hoenselaar & Moolenbeek (1987: 17, figs. 1–6); Giannuzzi-Savelli et al. (2002: 82, 83, fig. 259); Gofas et al. (2011: 193, 1 unnumbered figure).

TYPE LOCALITY. Tarifa, Spain.

TYPE MATERIAL. Not seen. Holotype (ZMA Moll. no. 3.87.001), 8 paratypes (ZMA Moll. no. 3.87.002), 15 paratypes (coll. Hoenselaar), 1 paratype, Tarifa, IV.1985 (coll. Hoenselaar).

EXAMINED MATERIAL. Spain: Tarifa, Cadiz, legit Gubbioli, 1988, beach, 1 sh (IN); Tarifa -30 m, 1 sh (SB-MS); Punta Carnero, Getares, 1 sh (CS); Cala Cica, Getares, 1 sh (CS).

ORIGINAL DESCRIPTION. Hoenselaar & Moolenbeek, 1987: "Description of the holotype. - Length 1.55 mm, width 0.76 mm (figs. 1–4, 6). Shell minute, elongate-conic, non-umbilicate, fragile and semitransparent, some gloss on its surface. Protoconch dome-shaped, a little less than 1 ½ whorls with about 7 smooth spiral cords (fig. 6). Between these cords there is a microsculpture of rows of exceedingly minute irregular pits, except for the first ½ whorl which looks smooth. Teleoconch with 2½ whorls, with a very fine spiral sculpture of more or less smooth spiral cords/ribs; in between these cords a spongy sculpture of irregular pits (fig. 3). Penultimate whorl with about 20 spiral cords, body whorl with about 38 spiral cords. Suture deep, whorls concave. On the base a strong spiral columellar twist (fig. 4). Aperture ovate with an opisthoclinal outer lip and a strong varix (fig. 5), peristome simple, weakly angled and channeled posteriorly, simple and rounded anteriorly. Operculum, periostracum and soft parts of the animal unknown."

DISTRIBUTION AND HABITAT. Reported for the Strait of Gibraltar (Spain) 0/-30 m.

REMARKS. *Onoba josae* compared to *O. tarifensis*, has a stronger and larger shell with fewer spiral cordlets both on the penultimate whorl and on the body whorl (9–14 and 22–26 respectively v. 18–24 and 31–38 respectively in *O. tarifensis*). See under *O. guzmani* for distinction from *O. tarifensis*.

***Onoba gianninii*** (Nordsieck, 1974) (Figs. 18–20)

*Setia (Crisillosetia) gianninii* Nordsieck, 1974: 11, fig. 4



*Cingula gianninii* (Nordsieck, 1974) (See Verduin, 1984: 61, fig. 25)

*Setia gianninii* Nordsieck, 1974 (See Amati & Nofroni, 1991: 32)

ICONOGRAPHIC REFERENCES. Nordsieck (1974: 11, fig. 4); Verduin (1984: 61, fig. 25); Oliverio (1988: 113, fig. 1 (operculum and radula)); Amati & Nofroni (1991: 32, figs. 6–10); Bouchet & Warén (1993: 662, figs. 1518, 1519); Ardovini & Cossignani (1999: 38, fig. 035); Smriglio & Mariottini (2000: 17, figs. 7, 8); Giannuzzi-Savelli et al. (2002: 82, 83, fig. 257); Scaperrotta et al. (2012: 63, 5 unnumbered figures).

TYPE LOCALITY. Strait of Bonifacio, Corsica, 'station K1', -200/220 m.

TYPE MATERIAL. Lectotype (designated by Amati & Nofroni, 1991) MCZR, 1 paralectotype (coll. Giannini, Empoli). Bouchet & Warén (1993: 662) reported some "paratypes" in coll. Carrozza, coll. van Aartsen and coll. SMNH (not listed in the original work), which should be more correctly defined as "paralectotypes".

EXAMINED MATERIAL. Lectotype (MCZR); France: Bastia, Corsica, depth (unprecised) bioclastic sands sample, 1 sh (BA); Italy: Capraia Is., Northern Tyrrhenian Sea, -400 m, 1 sh (BA); off Fiumicino, Central Tyrrhenian Sea, -300 m, 4 sh (BA); Capraia Is., Northern Tyrrhenian Sea, -350 m, 3 sh (IN); Capraia Is., Northern Tyrrhenian Sea, 1 sh (Bogi collection, Livorno).

ORIGINAL DESCRIPTION. Nordsieck, 1974: "Setia (Crisillosetia) gianninii n. sp. 3/1,7 mm. Olotipo nella collezione Giannini. Pallida, semitrasparente; 5 giri molto convessi, il primo (protoconca) attenuato. Sutura profonda. Circa 30/40 striae spirali sull'ultimo giro, 15 sul penultimo. Sottile plica ombelicale. Comparando questa indubbiamente nuova specie con tutte le altre del sottogenere (v. tavola R IV del Vol. III) ci si avvede che non esiste alcuna altra specie ad essa avvicinata sia per la convessità dei giri, il numero delle spirali e le misure della conchiglia."

DISTRIBUTION AND HABITAT. Central Mediterranean Sea: Corsica (France), Sardinia, Tuscany and Latium (Italy), Algeria -93 m. (Bouchet & Warén, 1993: 663). In bioclastic sediments from -93/500 m depth.

REMARKS. *O. gianninii* may sometimes have an additional labial varix. *O. oliverioi* and *O. gianninii* have been found sympatric in the Central Tyrrhenian Sea, in the deepest bathymetric range of *O. gianninii* (-200/600 m *O. oliverioi* v. -93/500 m of *O. gianninii*). The shells of these two species are very similar; *O. oliverioi* differs mainly for the smaller size (H 1.6–2.3 mm at 2.5–3 whorls v. H 2.5–2.6 mm at 2.5–3.25 whorls in *O. gianninii*), the flatter more sculpted and slightly smaller protoconch, (maximum diameter 0.40–0.44 mm v. 0.46 mm (fide Bouchet & Warén, 1993: 663 in *O. gianninii*), the less slender outline (H/W = 1.44/1.65 v. H/W = 1.66–1.80 in *O. gianninii*), and the larger aperture (H/Ha = 1.84–2.16 v. H/Ha = 2.18–2.22 in *O. gianninii*). See under *O. dimassai* for distinction from *O. gianninii*.

*Onoba oliverioi* Smriglio et Mariottini, 2000 (Figs 16, 17)

*Onoba oliverioi* Smriglio & Mariottini, 2000: 16, figs. 1-6

ICONOGRAPHIC REFERENCES. Bouchet & Warén (1993: 663, figs. 1520, 1521) (sub nomine *Onoba gianninii*); Smriglio & Mariottini (2000: 16, figs. 1–6).

TYPE LOCALITY. Central Tyrrhenian Sea (41° 51' N, 11° 28' E) off coast of Latium -350/600 m.

TYPE MATERIAL. Holotype (MZB 14000); 1 paratype, type locality (MCZR); 9 paratypes, type locality (CS); 1 paratype, type locality (MO); 1 paratype, type locality (PM).

EXAMINED MATERIAL. Type material partly examined: type locality, 9 paratypes (CS), type locality, 1 paratype (MCZR).

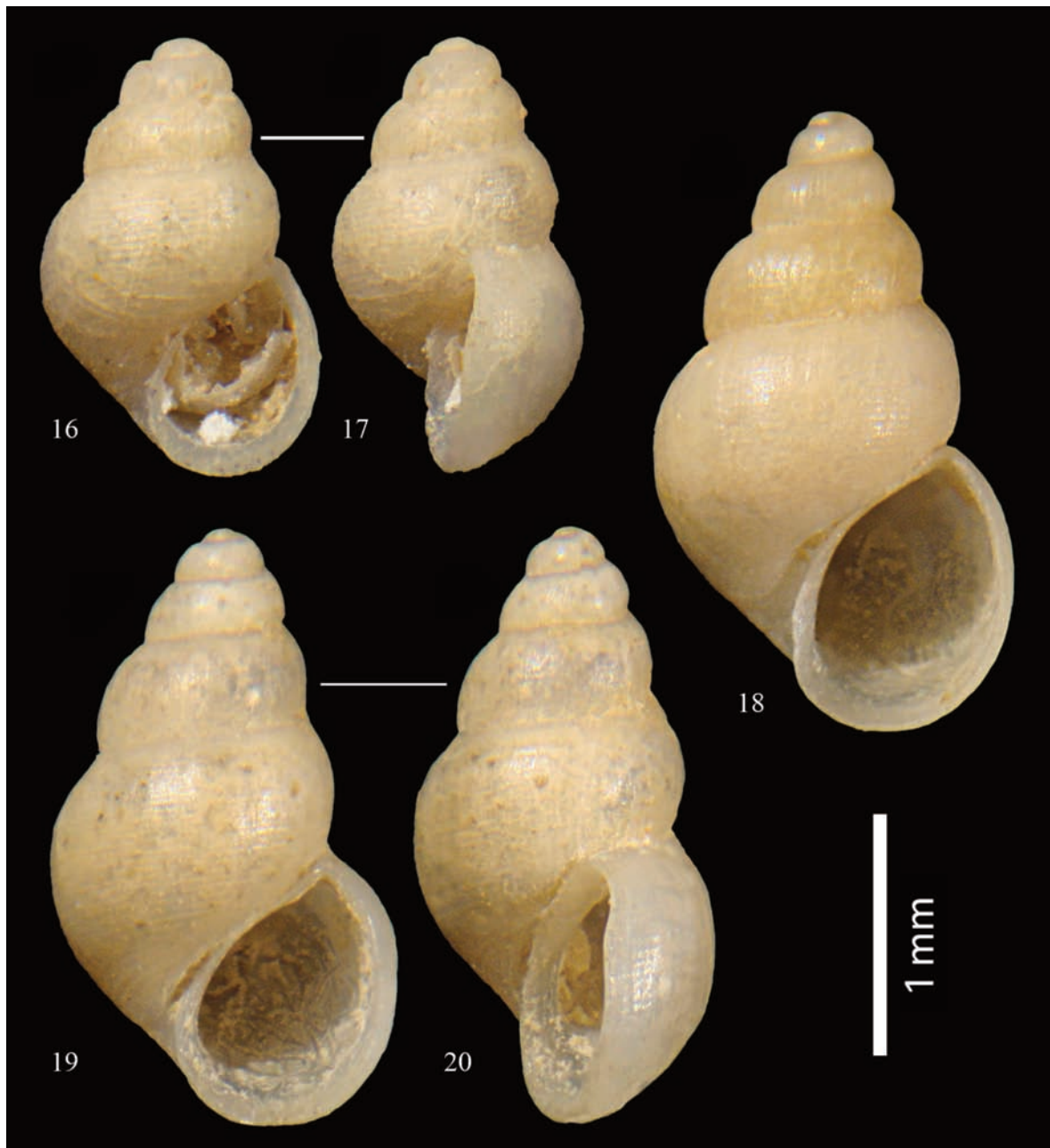
ORIGINAL DESCRIPTION. Smriglio & Mariottini, 2000: "Shell small (from 1.61 to 2.32 mm in height), conical-ovate, with a large aperture, blunt apex. Protoconch dome-shaped consisting of about 1.5 whorls, with a diameter of 400-440 µm, sculptured with 6-8 fine and irregular spiral cordlets. Among them, several other interrupted fine furrows create a sort of micro-tuberculated sculpture. Teleoconch of about 3.0 rounded convex whorls, the last one is about 2/3 of the entire length, average ratio H/W = 1.55, average ratio H/Ha = 1.99. Suture pronounced and shallowly channeled, axial growing lines evid-

ent, spiral sculpture consisting of about 27 evenly spaced ribs, with about 2-3 much smaller furrows in the inter-spaces. Aperture ovoid, umbilical crevice slightly visible. Colour milky-white or yellowish translucent. Operculum and animal unknown.”

DISTRIBUTION AND HABITAT. Italy: Central Tyrrhenian Sea: Latium and Sardinia. France: Corsica. On

muddy bottom in a deep-sea coral biocoenosis (biocoenosis VB and CB sensu Pérès & Picard, 1964) at a depth of -200/600 m (Bouchet & Warén, 1993: 663; Smriglio & Mariottini, 2000: 16).

REMARKS. *Onoba oliverioi* is characterized by having a shell with a low H/W ratio and to live at a maximum depth of -600 m. *O. oliverioi* differs



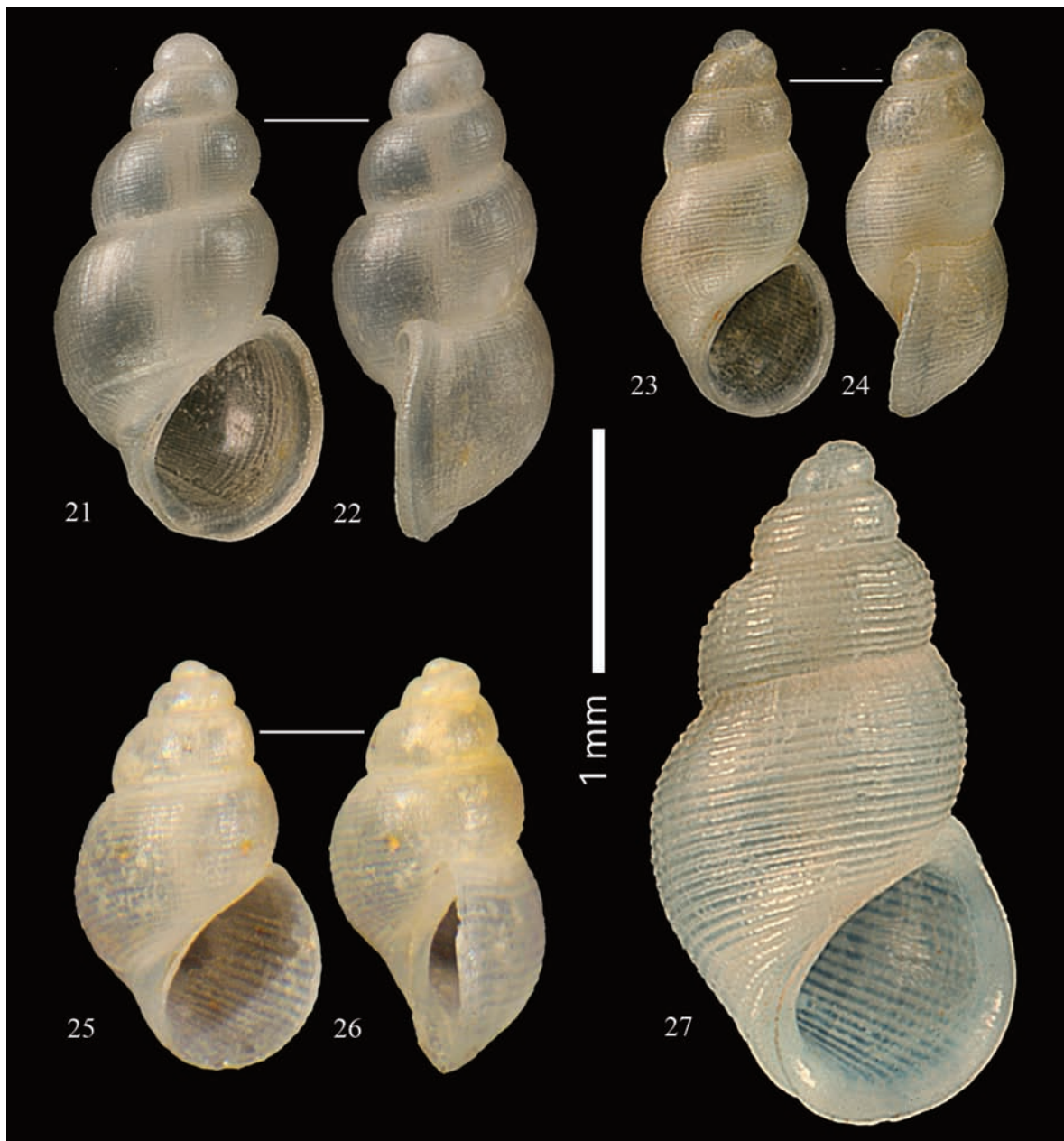
Figures 16–17. *Onoba oliverioi* Smriglio et Mariottini, 2000, Central Tyrrhenian Sea, Latium (Italy) paratype H, height 1.8 mm (CS). Figure 18. *O. gianninii* (Nordsieck, 1974): Fiumicino, Central Tyrrhenian Sea (Italy), height 2.6 mm (BA). Figures 19, 20. *O. gianninii*: Bastia, Corsica (France), height 2.5 mm (BA).

from *O. dimassai* for the deeper habitat (-200/600 m v. -15/50 m in *O. dimassai*), by its higher number of protoconch whorls (about 1.5 v. 1.2–1.25 in *O. dimassai*), the protoconch sculptured with 6–8 fine irregular spiral cordlets v. an apparently smooth protoconch (also at SEM) in *O. dimassai* and a larger maximum diameter of the protoconch (0.40–0.44

mm v. 0.30–0.38 mm in *O. dimassai*). The number of the spiral cordlets on the teleoconch is broadly similar in the two species (about 25–30). See under *O. gianninii* for distinction from *O. oliverioi*.

*Onoba* sp. (Figs. 25, 26)

*Onoba* sp. A. Amati & Nofroni, 1991: 34, fig. 5



Figures 21, 22. *Onoba guzmani* Hoenselaar et Moolenbeek, 1987, Tarifa (Spain), height 2.1 mm (SB-MS). Figures 23, 24. *O. tarifensis* Hoenselaar et Moolenbeek, 1987, Tarifa (Spain), height 1.6 mm (SB-MS). Figures 25, 26. *Onoba* sp. San Felice Circeo, Central Tyrrhenian Sea (Italy), height 1.7 mm (BA). Figure 27. *O. josae* Moolenbeek et Hoenselaar, 1987, Tarifa (Spain), height 2.8 mm (SB-MS).



Character	<i>Onoba semicostata</i>	<i>Onoba aculeus</i>	<i>Onoba dimassai</i>	<i>Onoba josae</i>	<i>Onoba guzmani</i>	<i>Onoba tarifensis</i>	<i>Onoba gianninii</i>	<i>Onoba oliverioi</i>
H	1.8-3.5	2.0-4.5	1.4-2.2	2.2-3.2	1.4-2.1	1.45-1.75	2.5-2.6	1.61-2.32
W	1.15-1.35	1.35-2.0	0.9-1.15	1.3-1.5	0.7-1.1	0.75-0.82	1.5-1.55	1.08-1.4
Ha	1.0-1.15	1.08-1.1	0.75-0.95	1.1-1.2	0.59-0.95	0.72-0.75	1.2-1.3	0.85-1.11
R.H/W	2.0-2.59	2.25-2.36	1.56-1.82	1.63-1.81	1.9-1.98	2.0-2.06	1.66-1.8	1.44-1.65
R.H/Ha	2.30-3.04	2.77-2.96	1.88-2.21	2.0-2.22	2.21-2.37	2.22-2.39	2.18-2.22	1.84-2.16
Tcs	yes	yes	no	no	no	no	no	no
St	deep, and channeled	deep, slightly to scalariform	slightly channeled	deep	deep	deep	deep	pronounced and shallow channeled
Nw	2.8-3.8 (5/5.5)*	3.8 (4.5/5.6)*	2-3	3.25-3.5	2.75-3	2.5-2.75	2.5-3.25	2.5-3
Nspw	12-15	10-14	8-15	9-14	microscopical pit-marks more or less forming spirals	18-24	15-17	11-12
Nslw	25-29	22-24	18-30	22-26	4 shallow spirals on the base	31-38	30-40	23-31
Asc	yes	occasionally, pronounced striae of growth	no	occasionally	no	no	no	no

Table I. Ranges of morphometric characters of the teleoconch in Mediterranean species of the genus *Onoba*. Measurements in mm. H: height; W: width; Ha: height aperture; R.H/W: ratio height/width; R.H/Ha: ratio height/height aperture; Tcs: Tendency to curved shells; St: Suture; Nw: number of teleoconch whorls; Nspw: Spiral cords on the penultimate whorl; Nslw: number of spirals cords on the last whorl; Asc: Axial subsutural cords. \*( ) Da Nekhaev et al., 2014. Probably also include the whorls of the protoconch.

ICONOGRAPHY REFERENCES. Amati & Nofroni (1991: 34, fig. 5)

EXAMINED MATERIAL. Italy: San Felice Circeo, Central Tyrrhenian Sea, -30/50 m, VIII.1982, legit Angelo Amati, 1 sh (BA).

DESCRIPTION. Shell small, fragile, ovate-conical shape, semi-transparent, non umbilicated. Protoconch dome-shaped, paucispiral, with slightly twisted nucleus, consisting of just over one whorl (estimate uncertain, protoconch-teleoconch boundary not clearly visible), 0.25 mm high, with a nucleus diameter of 0.13 mm and a maximum diameter of 0.32 mm without microsculpture as seen at a magnification of 90x. Teleoconch of 2.8 convex whorls with deep suture. Outer lip not tickened (probably the specimen was not fully adult) orthocline. Sculpture of 24 fine and flat spiral cordlets on the body whorl, 12 of which above the aperture. Finer threads covering the entire surface, visible at a magnification of 90x. Color white. Operculum and soft parts unknown.

Dimensions: H = 1.7 mm, W = 1.05 mm, Ha = 0.84 mm, H/W ratio = 1.619; H/Ha ratio = 2.023.

DISTRIBUTION AND HABITAT. San Felice Circeo, Central Tyrrhenian Sea, Italy, a single shell in organogenic detritus in the infralittoral at -30/50m. Found sympatric with *O. dimassai* and *O. josae*.

REMARKS. The single shell, so far known, is peculiar among the European *Onoba*, in its particular apex, with a paucispiral protoconch and a twisted nucleus. It is easily recognizable from all other species. *Onoba dimassai* is similar in the fragile shell, the white colour, the orthocline outer lip and the teleoconch spiral sculpture. It differs, however, in the different (not twisted) apex and the wider and more spaced teleoconch spiral cordlets. *O. nunezi* Rolán et Hernandez, 2004, endemic to the Canary Islands, is slightly smaller (about H 1.3 mm v. H 1.7 mm in *Onoba* sp.), is more slender, has a teleoconch spiral sculpture of about 10 weak well-spaced cordlets and the whole teleoconch surface is covered with finer and more numerous threads (Rolán & Hernandez, 2004: 174). *Manzonina vigoensis* (Rolán, 1983) was described as belonging to the genus *Onoba* but later Moolenbeek & Faber (1987)

and Moolenbeek & Hoenselaar (1992) assigned it to the genus *Manzonina* Brusina, 1870; it resembles *Onoba* sp. for the general shape of the shell and the paucispiral protoconch with a twisted nucleus; but differs for the different sculpture of the teleoconch, with aligned micro-perforations a thickened outer lip both typical of the genus *Manzonina*.

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