

Description of a new species of the genus *Raphitoma* Bellardi, 1847 from the Mediterranean Sea (Mollusca Neogastropoda Conoidea Raphitomidae)

Francesco Pusateri¹, Riccardo Giannuzzi Savelli^{2*} & Peter Stahlschmidt³

¹via Castellana 64, 90135 Palermo, Italy; e-mail: francesco@pusateri.it

²via Mater Dolorosa 54, 90146 Palermo, Italy; e-mail: malakos@tin.it

³University of Koblenz-Landau, Institute for Environmental Sciences, Fortstraße 7 - 76829 Landau, Germany; e-mail: stahlschmidt@uni-landau.de

*Corresponding author

ABSTRACT

The family of Raphitomidae is currently considered a well supported clade of the Conoidea. The type genus *Raphitoma* Bellardi, 1847 is well known in the mediterranean Seas with about 40 species, some of which are still undescribed. Morphological analyses carried out on the genus *Raphitoma* Bellardi, 1847 (Mollusca Neogastropoda Conoidea Raphitomidae) from Mediterranean Sea allowed to identify a new species which is described in the present paper.

KEY WORDS

Raphitoma; Conoidea; new species; Mediterranean Sea.

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INTRODUCTION

The Raphitomidae Bellardi, 1875 are currently considered a well supported clade of the Conoidea (Bouchet et al., 2011).

The superfamily Conoidea, with over 300 genera and 4,000 recognised species, but probably over 12,000 extant species (Bouchet, 1990; Tucker, 2004), represents the largest radiation of the entire phylum Mollusca. In a work on the phylogeny of the group based on a cladistic analysis of foregut morphology, Taylor et al. (1993) have highlighted the rampant homoplasy in the characters of shell and radula in conoideans.

Accordingly, they have rearranged most of the conoideans into two families: Conidae, comprising Coninae and 4 subfamilies traditionally considered

as “turrids”, and Turridae s.s. including some of the traditional “turrids”. More recently, Puillandre et al. (2008) and Bouchet et al. (2011), based on DNA phylogeny, have provided a major update of conoidean classification. Although a larger taxonomic coverage would be desirable to further stabilize the molecular phylogeny, however, the position of the Raphitomidae as a clade of the Conoidea is sufficiently supported.

The taxon Raphitomidae is based on the genus *Raphitoma* Bellardi, 1847 which was introduced as comprising 30 fossil and Recent species (Bellardi, 1847: 85), previously classified in various genera (such as *Pleurotoma* Lamarck, 1799 and *Clathurella* Carpenter, 1857).

Among the modern authors, Nordsieck (1977) listed 30 european species of Raphitomidae plus sev-

eral subspecies and varieties. In the revision of the mediterranean Raphitomidae that we are currently carrying out, we estimated about 40 mediterranean species, some of which are still to be described (see Pusateri et al., 2016).

ABBREVIATIONS AND ACRONYMS. CAH: André Hoarau collection (Fréjus, Francia); CFP: Francesco Pusateri collection (Palermo, Italy); CGN: Giuseppe Notaristefano collection (Messina, Italy); CJD: Jean Louis Deleamarre collection (Saint Nazaire, France); CMM: Max Marrow collection (Melbourne, Australia); CPO: Panayotis Ovalis collection (Athens, Greece); CPS: Peter Stahlschmidt collection (Landau, Germany); CAR: Alessandro Raveggi collection (Firenze, Italy); CRA: Roberto Ardovini collection (Rome, Italy); CRO: Rosario Occhipinti collection (Ragusa, Italy); MBMPRC: Museo di Biologia Marina e Paleontologia di Reggio Calabria; MCZR: Museo Civico Zoologia Roma (Rome, Italy); MNHN: Museum National d'Histoire Naturelle (Paris, France); h: height; sh: shell/s; Std: standard deviation; D: diameter.

RESULTS

Systematics

Citation of unpublished names is not intended for taxonomic purposes.

Classis GASTROPODA Cuvier, 1795
Subclassis CAENOGASTROPODA Cox, 1960
Ordo NEOGASTROPODA Wenz, 1938
Superfamilia CONOIDEA Fleming, 1822
Familia RAPHITOMIDAE Bellardi, 1875
Genus *Raphitoma* Bellardi, 1847

Type species: *Pleurotoma hystrix* Cristofori et Jan, 1832 (*nomen nudum*, validated by Bellardi, 1847 as "*Pleurotoma hystrix* Jan.") by subsequent designation (Monterosato, 1872: 54).

Raphitoma ephesina n. sp.
= *Raphitoma rugosissima* Monterosato ms.

EXAMINED MATERIAL. Type material: Holotype (Bozcaada Island, Turkey) -95 m, mm 5.7 x 2.7 (MNHN); paratype A (Saronic Bay, Aegean Sea, Greece), mm 5.8 x 2.9 (CFP); paratype B (Bozcaada Island), mm 7.2 x 3.5 (MNHN); para-

type C (Veli Rat, Dugi Otok Island, Croatia), mm 7.1 x 3.6 (CFP); paratype D (Scilla, Reggio Calabria, Italy), -52 m "*alla base del Secondo Dente di Skylla*" (38°15'25,05"N - 15°42'46,11"E), mm 5.3 x 2.7 (MBMPRC, legit A. Vazzana).

OTHER MATERIAL EXAMINED. France. St. Raphael, 2 sh (CAH).

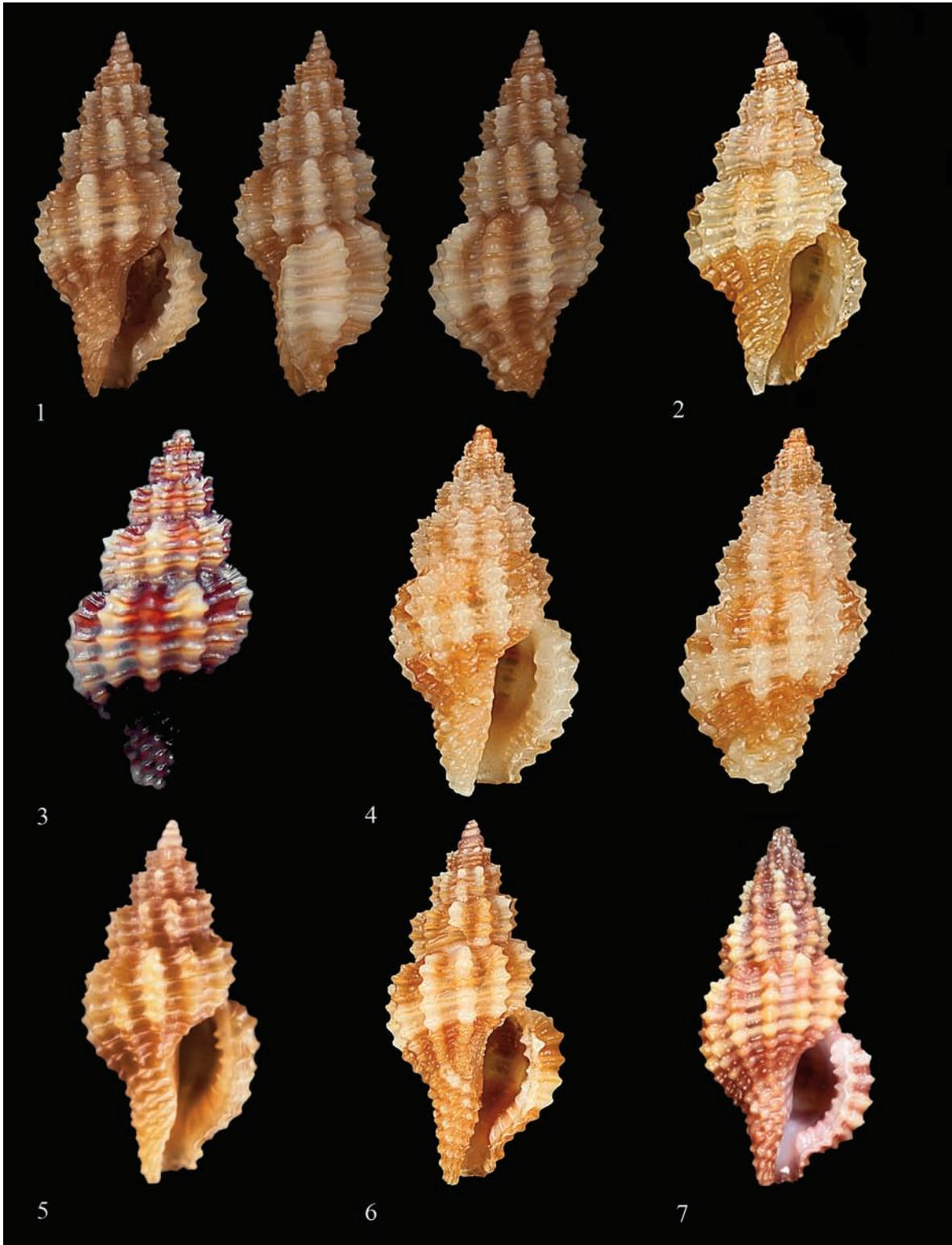
Italy. Porto Venere (La Spezia), 3 sh (CMM); Sardegna, 1 sh (CRA); Scilla, Reggio Calabria, -52 m "*alla base del Secondo Dente di Skylla*", 38°15'25.05"N - 15°42'46.11"E, 3 sh. (MBMPRC, legit A. Vazzana); Milazzo, 1 sh (CGN); Trapani, 1 sh (CRA)

Croatia. Veli Rat - Dugi Otok Island, 6 sh (CFP), 1 sh. coll. Monterosato lot 16468 sub nomine *R. rugosissima* ms. (MCZR), sine loco, 1 sh (CJD).

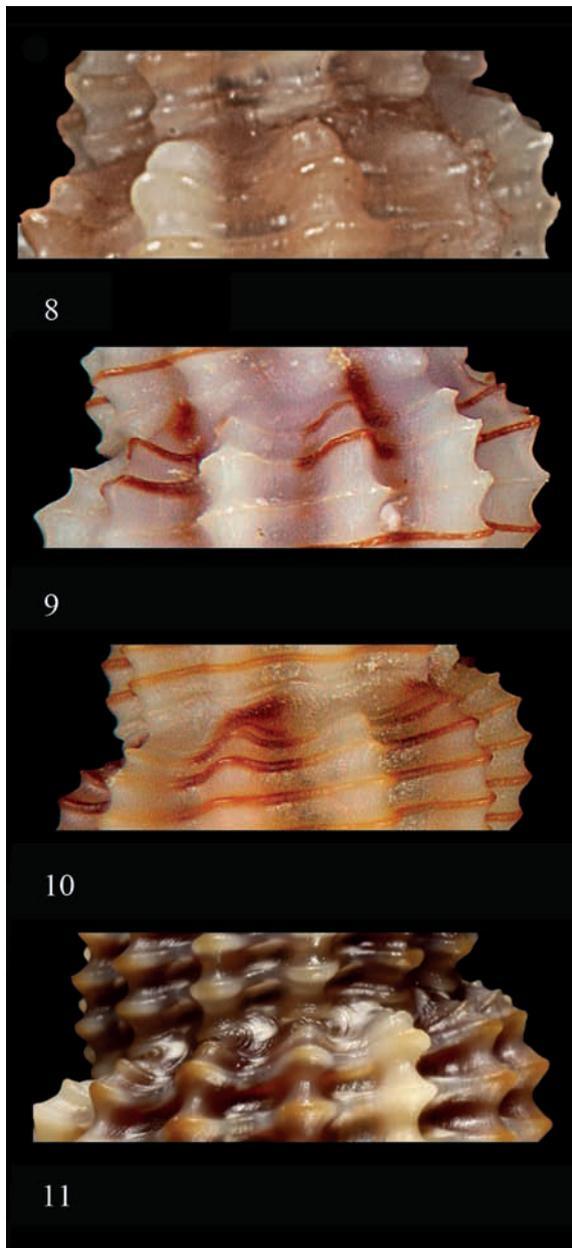
Greece. Evia Island (Aegean Sea), 1 sh (CPO); Saronic Bay, 1 sh (CPO); Kolovri Islet, Corfù, 3 sh (CAR).

Turkey. Bozcaada Island, 1 sh (CPS); 3 sh (CRO).

DESCRIPTION OF HOLOTYPE. Shell of small size for the genus, height 5.7 mm, width 2.7 mm, biconical with slender upper part, H/D 2.11. Protoconch multispiral of 3.6 convex whorls, height 520 µm, width 430 µm; protoconch I of 1 whorl, width 175 µm, with cancellate sculpture of orthocone axials and spirals of equal strength; protoconch II of 2.6 whorls, with diagonally cancellate sculpture on the lower two thirds, and subsutural orthocone axials on the upper third. Teleoconch of 4.5 slightly convex whorls. Suture not incised, evident. Axial sculpture of 10 slightly prosocline elevated and strong ribs, and interspaces broad as the ribs. Spiral sculpture of 5 prominent cordlets on the penultimate whorl, (the first, subsutural, weak) thinner than axial ribs and interspaces four times as broad as the cordlets. Cancellation horizontally rectangular, deep with semitransparent back wall. The second cordlet at the intersection with the ribs form tubercles more acute than others with a mammillary appearance. Subsutural ramp very short. Columella simple, slightly sinuous anteriorly and gently angled posteriorly. Outer lip thickened and crenulated externally with 7 strong inner denticles, the most anterior larger. Anal sinus evident but not deep, Siphonal canal long, wide, funnel like. Siphonal fasciole of 7 nodulose strong cordlets. Background and cordlets color usually soft cherry



Figures 1–7. Shells of *Raphitoma ephesina* n. sp. Fig. 1: holotype, Bozcaada Island, Turkey (MNHN, h: 5.7 mm); Fig. 2: paratype A, Saronic Bay, Greece (CFP, h: 5.8 mm); Fig. 3: Saronic Bay (Greece (CPO, h: 6.7 mm); Fig. 4: paratype C, Velirat Isl., Croatia (CFP, h: 7.1 mm); Fig. 5: paratype D, Scilla, Reggio Calabria, Italy (MBMPRC, h: 5.3 mm); Fig. 6: Trapani, Italy (CRA, h: 6 mm); Fig. 7: St. Raphael, France (CAH, h: 7.5 mm).



Figures 8–11. Particulars of cordlets of *Raphitoma*. Fig. 8: *R. ephesina* n. sp.; Fig. 9: *Raphitoma linearis* (Montagu, 1803); Fig. 10: *Raphitoma aequalis* (Jeffreys, 1867); Fig. 11: *Raphitoma bicolor* (Risso, 1826).

except the over sutural cordlet which is white. The summit of the cordlets resumes the background color. Many ribs are white or whitish. The lower part of the last whorl is evenly soft cherry. Soft parts are unknown.

VARIABILITY. Height 5–7.5 mm (mean 6.2, std 0.62), width 2.5–3.7 mm (mean 3.06, std 0.36), H/D

1.86–2.14 (mean 2.02, std 0.08); axial sculpture of 9–12 ribs (mean 11, std 1.27); outer lip with 7 denticles, siphonal fasciole with 7 nodulose cordlets (exceptionally 6). The colour range from light to dark cherry.

ETYMOLOGY. Dedicated to goddess Artemis of Ephesus, called “the polimastic” because of the four rows of breasts that cover the bust which recall the sculpture of this new species.

DISTRIBUTION. The new species is widely distributed in the Mediterranean Sea (so far known from France, Italy, Croatia, Greece, and Turkey).

REMARKS. For some of its conchological features *R. ephesina* n. sp. is akin to the group of *R. linearis* (Montagu, 1803)–*R. aequalis* (Jeffreys, 1867). It shares a similar shell size, profile, the prominent cords with the colored top, the same number of protoconch whorls (3.6), and the almost equal protoconch dimensions.

In particular it differs from *R. linearis* by the lack of microgranules in sculpture, by the number of cordlets on the penultimate whorl (5 vs. 4). The top of the cordlets of *R. linearis* is colored, sometimes strongly, only in the first two subsutural and fourth. It also differs in the background color which in *R. linearis* is generally cream or whitish with the first whorls slightly purple and in the color of protoconch which is white. The denticles of *R. linearis* are barely noticeable only in gerontic specimens while they are clearly visible in *R. ephesina* n. sp.

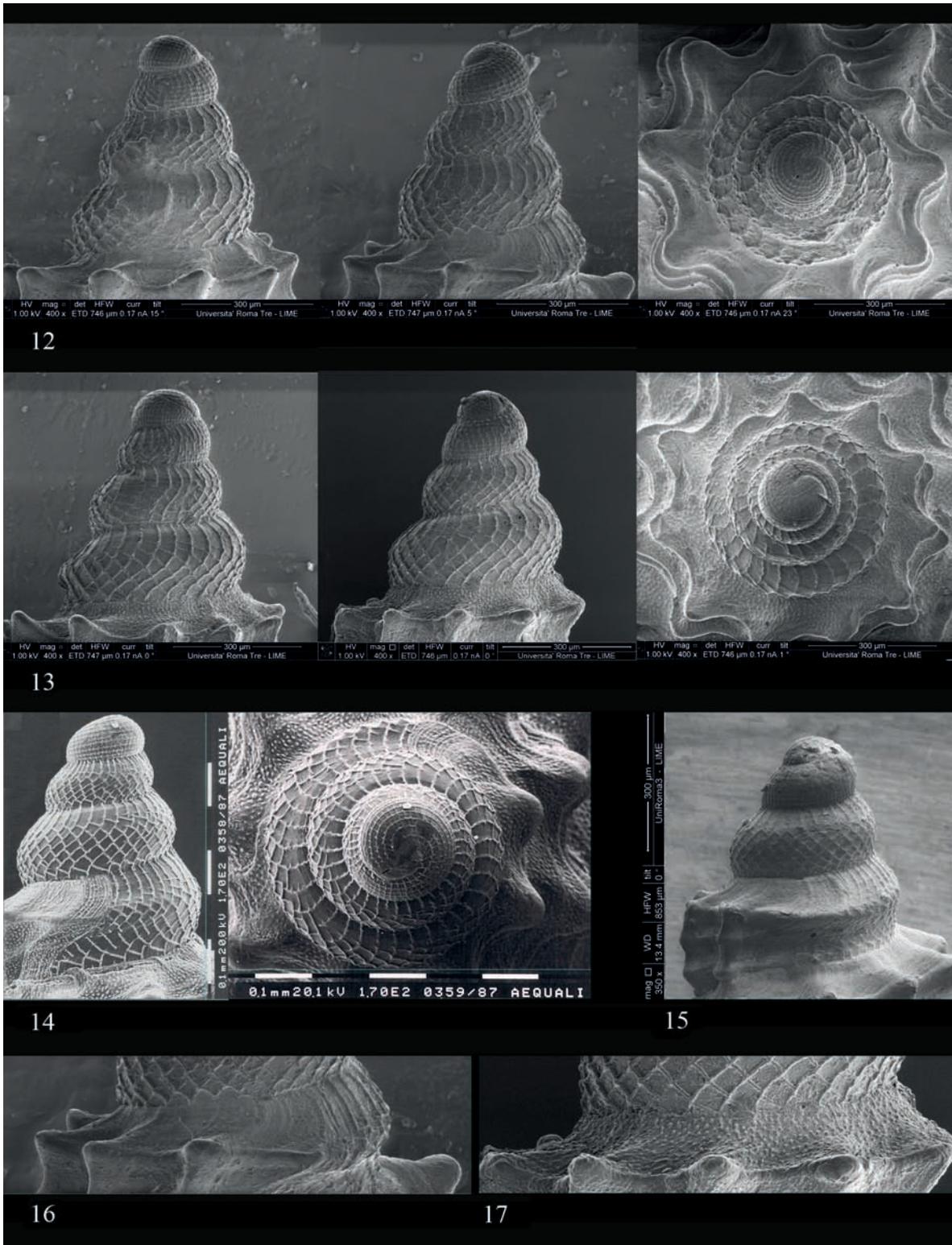
It differs from *R. aequalis*, by the lack of microgranules in sculpture and by the number of cords on the penultimate whorl (5 vs 6–7). In *R. aequalis* cordlets are always brown colored except those next to the suture which are white coloured.

Also it differs for the background color and that of the protoconch that in *R. aequalis* are generally whitish.

Raphitoma ephesina n. sp. could eventually be confused with juveniles of *R. bicolor* but their protoconchs are quite different (see figures 12 and 15).

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Figures 12–15. Protoconchs: 12: *Raphitoma ephesina* n. sp.; 13: *Raphitoma linearis*; 14: *Raphitoma aequalis*; 15: *Raphitoma bicolor*. Figures 16–17: Particulars showing lacking (Fig. 16: *R. ephesina* n. sp.) and presence (Fig. 17: *R. linearis*) of microgranules on the shell surfaces

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