

Cassiella nov. gen., a cerithiacean endemic to the Strait of Gibraltar

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Cassiella abylenis n. sp. is the type species of a new cerithiacean genus. It is a small littoral species, at present known from a restricted range in the Strait of Gibraltar. The genus shows no direct affinity to any other Mediterranean or Atlantic taxa; definitive assignment at family level should await a forthcoming anatomical study.

Key words: Gastropoda, Prosobranchia, Cerithiacea, taxonomy, Mediterranean, Strait of Gibraltar.

INTRODUCTION

Collecting in the vicinity of the Strait of Gibraltar has yielded abundant material from several populations of a small cerithiacean, apparently undescribed and not related to any known living European species. The new genus *Cassiella* is introduced for this species, known only from a very restricted range.

Most of the material has been collected during the "Ceuta '86" expedition, organized jointly by the Muséum National d'Histoire Naturelle of Paris (P. Bouchet) and the University of Sevilla (J.C. Garcia Gomez) in May 1986; the remainder of the specimens was collected earlier (1972-1980) by the present author.

Cassiella nov. gen.

Type species. — *C. abylenis* nov. spec.

Etymology. — Dedicated to the yacht-club CAS of Ceuta, which has been housing the "Ceuta '86" field laboratory.

Shell small (2-3 mm long), usually pigmented, turritiform. Protoconch paucispiral (1½ whorls), not clearly demarcated from teleoconch. Teleoconch (5-6 whorls) with predominantly spiral sculpture, no varices or clear growth stages. Aperture rounded anteriorly, without notch or suggestion of siphonal canal. Outer lip simple, never expanded.

Head with elongate, bilobed snout and two stout cylindrical tentacles. Foot short and broad, with no apparent groove on sole. Head-foot unpigmented except for small yellow granules behind eyes and beneath operculum.

Operculum ovate, with few spiral whorls, corneous, thin, borne on two massive opercular lobes. Radula taenioglossate.

SYSTEMATIC POSITION

The external morphology recalls that of the genus *Bittium* (figs. 14-15), but the cephalic tentacles are shorter and the head-foot is unpigmented.

The genus *Cerithidium* was introduced by Monterosato (1884) as characterized by (translated) "the absence of a canal and almost rounded aperture". The only species included in the original publication is *Cerithium submammillatum* Rayneval & Ponzi,

1854, which Monterosato considers a synonym of *Turritella? pusilla* Jeffreys, 1860. The former name was originally given to a Pleistocene fossil which has not been proved to be conspecific with the Recent species. Designation of *Cerithium submammillatum* as type species of *Cerithidium* by Cossmann (1906) should prevail over that of *Turritella pusilla* by Wenz (1940). Both species are congeneric and conchologically very similar to *Bititium reticulatum* (Da Costa, 1778). Cossmann (1906) has illustrated a topotype of *Cerithidium submammillatum*, obtained from Monterosato. A syntype of *C. pusillum* is illustrated in fig. 16.

The smooth shelled forms of *Cassiella* strongly resemble some rissoids, and the habitat of *Cassiella* contains several species of *Rissoa* with convergent size and general shape. A list of taxa originally described as rissoids and belonging to other families has been compiled by Ponder (1985), but none of these is related to the present species.

The shell, radula and operculum of *Cassiella* are typical of the lower Mesogastropoda. The morphology of the head-foot and the absence of a penis suggest that it is a cerithiacean. A forthcoming anatomical study by W.F. Ponder (Australian Museum, Sydney) should allow a better assessment of relationships of the genus within that superfamily.

The type species is described below.

***Cassiella abylenis* nov. spec.**

Type material. — Holotype (figs. 1-3): Benzú (north shore of Ceuta), collected alive at low tide; paratypes: ibidem, 10 specimens collected alive and 25 shells; Sarchal (south shore of Ceuta), 39 specimens collected alive in tide pools; Oued er Rmel (Morocco, west of Ceuta), 2 shells; Punta Cires (Morocco), 1 specimen collected alive; Tangier (shore drift), 6 shells; NW. of Tarifa (Spain), 1 shell. The holotype and some paratypes are in the Muséum National d'Histoire Naturelle, Paris. Paratypes have been distributed to the following institutions: Rijksmuseum van Natuurlijke Historie, Leiden; Instituto de Investigação Tropical (Centro de Zoologia), Lisbon; Museo Nacional de Ciencias Naturales, Madrid; Australian Museum, Sydney.

Type locality. — Benzú (north shore of Ceuta), at low water of spring tide among algae.

Etymology. — From the phenician name Abyla for the town of Ceuta.

Description. — Adult shell reaching 2.5 mm (holotype 2.2 × 1.1 mm), with tall spire. Protoconch one and a half whorls, with very fine spiral microsculpture seen only under the S.E.M., otherwise seemingly smooth; protoconch demarcated from teleoconch by a sinuous, hardly noticeable line. Teleoconch 5-6 moderately convex whorls, with variably developed spiral sculpture, usually consisting of several rounded, flattened spiral cords, one of which is more prominent in heavily sculptured specimens. No axial sculpture, except for conspicuous growth lines.

Aperture rounded in front, without notch or irregularity in the usual position of a siphonal canal. Outer lip simple, orthocline, not expanded.

Shell dark brown or white, usually with darker flames producing an articulated pattern on spiral cords.

Head rather large, with elongated, bilobed snout and two stout cylindrical tentacles. Eyes at outer bases of tentacles, slightly protruding. A group of small, yellow granules behind each eye.

Foot short and broad, truncated anteriorly, rounded posteriorly, with an inconspicuous groove just above the edge of the sole all around. The sole itself does not show any apparent groove or opening for a posterior pedal gland. Head-foot colourless, except for the yellow granules.

Operculum ovate, with a round nucleus and three spiral whorls, corneous, thin. Opercular lobes massive. A cluster of yellow granules may be seen through the transparent operculum.

Radula taenioglossate. Central teeth each with a prominent median cusp with an axial thickening, three to four smaller lateral cusps, and two indistinct basal denticles. Lateral teeth elongate, with a large triangular cusp bordered by only one smaller cusp on the inner side and by seven or eight cusps decreasing in size towards the outside. Marginal teeth elongate, with curved inner end; inner marginal teeth with a lanceolate distal part (denticulate on both sides); outer marginal teeth tapering, denticulate only on their inner edge and fitting below the denticulate part of the inner marginals.

Variability. — Observed variability of the shell usually concerns development of the spiral sculpture and the colour.

(a) The spiral cords may be extremely well developed (figs. 4-5), or, on the other hand, may be virtually absent, so that the shell then resembles that of a rissoid (figs. 6-7). The sculpture of the holotype is representative of an average type of sculpture. When the spiral sculpture is strongly developed, there may be a more prominent cord, resulting in carination of the whorls (figs. 4-5), or several similarly developed cords (fig. 9; Van Aartsen, Menkhorst & Gittenberger, 1984, fig. 393).

(b) The shell may be uniformly dark brown, with or without distinct darker flames, or white.

Some of this variation appears to be related to distribution.

(a) The population from Sarchal has predominantly smooth or poorly sculptured shells, which are dark brown with indistinct flames. Strongly carinate morphs are exceptional, as are white shells.

(b) The population from Benzú mostly includes carinate morphs; white shells or shells with contrasting flames are common. Smooth shells have not been observed in this population.

(c) The few shells from Tangier all have evenly developed spiral cords; three out of six are white.

Habitat. — *Cassiella abylenis* has been found at low water of spring tide, mostly in tidal pools on the rocky shore. It lives among brown algae, particularly *Halopteris scoparia* (L.) Sauvageau. Other species collected in the same habitat at Sarchal are *Tricolia nordsiecki* (Talavera, 1978), *Rissoa similis* (Scacchi, 1836), *Alvania scabra* (Philippi, 1844), *A. spinosa* (Monterosato, 1890), *Skenea planorbis* (Fabricius, 1780), *Nodulus contortus* (Jeffreys, 1856), *Cerithium rupestre* Risso, 1826, and *Bittium reticulatum*. The associated mollusc fauna is richer in Benzú where *Woodwardia* sp., *Gibbula tingitana* Pallary, 1902, *Tricolia tingitana* Gofas, 1982, *Nassarius tingitanus* (Pallary, 1901), and some Mitridae and Marginellidae were found.

The habitat of *Cassiella abylenis* is restricted to this rather high sublittoral level. The species has not been found in infralittoral environments (3-25 m deep), thoroughly sampled during the same excursion. However, these habitats often contained many of the species associated with *Cassiella*.

DISCUSSION

Van Aartsen, Menkhorst & Gittenberger (1984: 75, fig. 393) have figured this species from a lot of 42 specimens collected at Getares (near Algeciras on the northern shores of the Strait of Gibraltar). However, as no live collected specimen was available to them, they considered the possibility of this being a transported freshwater species and prudently did not name it.

Young specimens of *Cerithium rupestre* are found together with *Cassiella*. As regards size and shape of the protoconch and general shape of the shell (fig. 17) these look similar. However, they are readily recognized by the shape of the aperture with a straight columella protruding anteriorly where the siphonal canal will be formed. Also, the spiral cords of *C. rupestre* show incipient nodules which are absent in *Cassiella*.

The yellow granules behind the eyes and below the operculum are common to small mesogastropods (Rissoidea, Vitrinellidae, Triphoridae, Cerithiopsidae); their function is unknown.

The extremely restricted distribution of the new species (fig. 20) calls for some comments. The protoconch suggests a lecithotrophic larval development, but this does not prevent a wider distribution in other species (e.g., *Cerithium rupestre*).

A few other species have a similarly restricted range in the vicinity of the Strait of Gibraltar. This type of endemism may be only apparent as regards small, inconspicuous species known only from their type locality. Nevertheless it does occur. *Nassarius tingitanus* is an example of a common species in the Strait of Gibraltar, having been found between Tangier and Mdiq on the Moroccan coast, and between Cádiz and Algeciras on the shores of Europe. This species has a reasonably large shell, but it has never been found outside of the small area mentioned.

Several smaller species, such as *Tricolia nordsiecki*, *Skeneopsis sultanarum* Gofas, 1983, *Gibberula janseni* Van Aartsen, Menkhorst & Gittenberger, 1984, many of them associated with *Cassiella abylenis* in its habitat, show a similar endemic distribution pattern. It may be noted that most of these are shallow water species like *Cassiella*, living among algae high in the infralittoral zone.

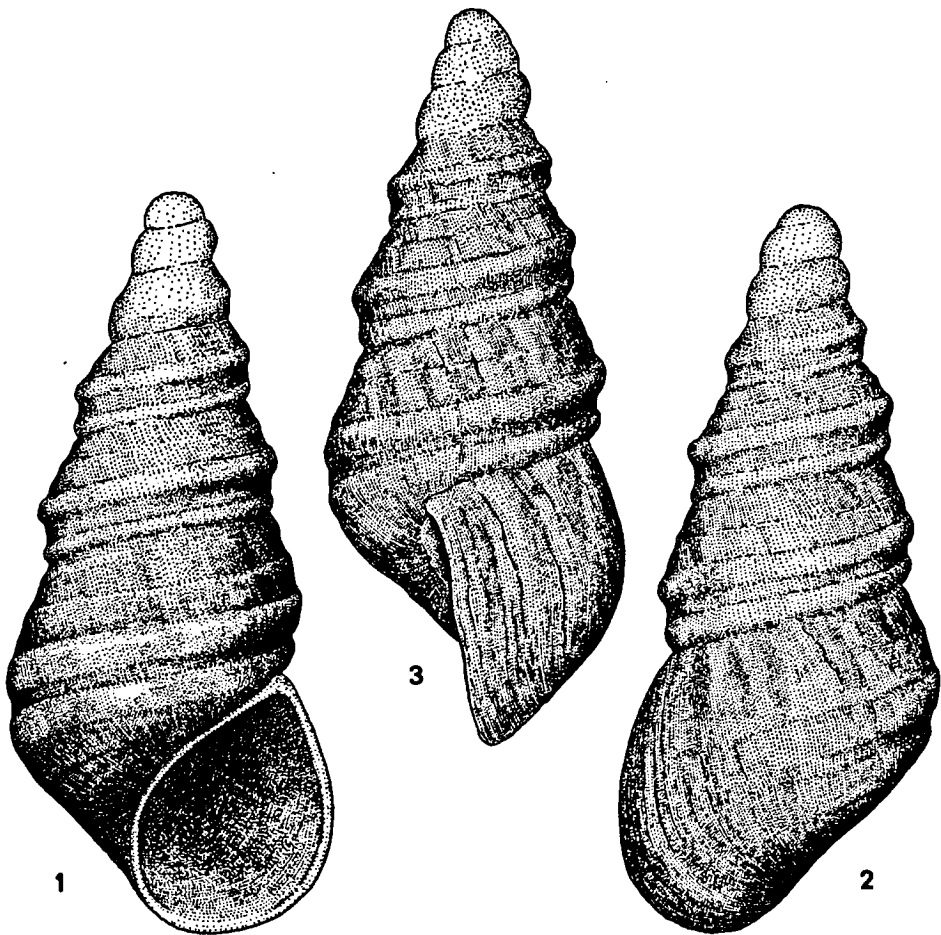
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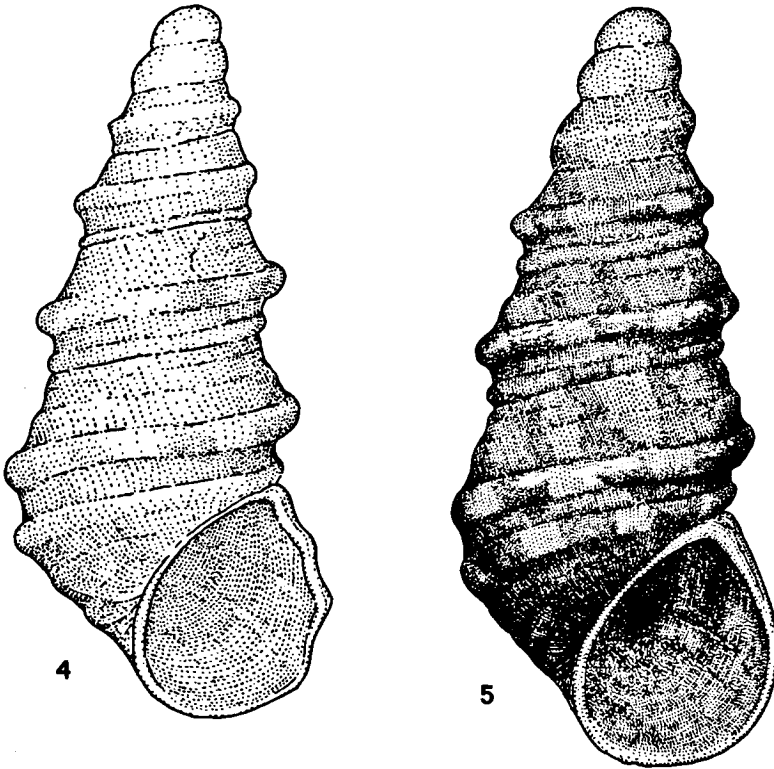
REFERENCES

- AARTSEN, J.J. VAN, H.P.M.G. MENKHORST & E. GITTENBERGER, 1984. The marine Mollusca of the Bay of Algeciras, Spain, with general notes on *Mitrella*, *Marginellidae* and *Turridae*. — *Basteria* Suppl. 2: 1-135.
- , & A. VERDUIN, 1982. European marine Mollusca: notes on less well-known species. VI. *Cerithidium submammillatum* (Rayneval & Ponzi, 1854). — *Basteria* 46: 129-131.
- COSSMANN, M., 1906. *Essais de paléoconchologie comparée* 6: 1-261. Paris.

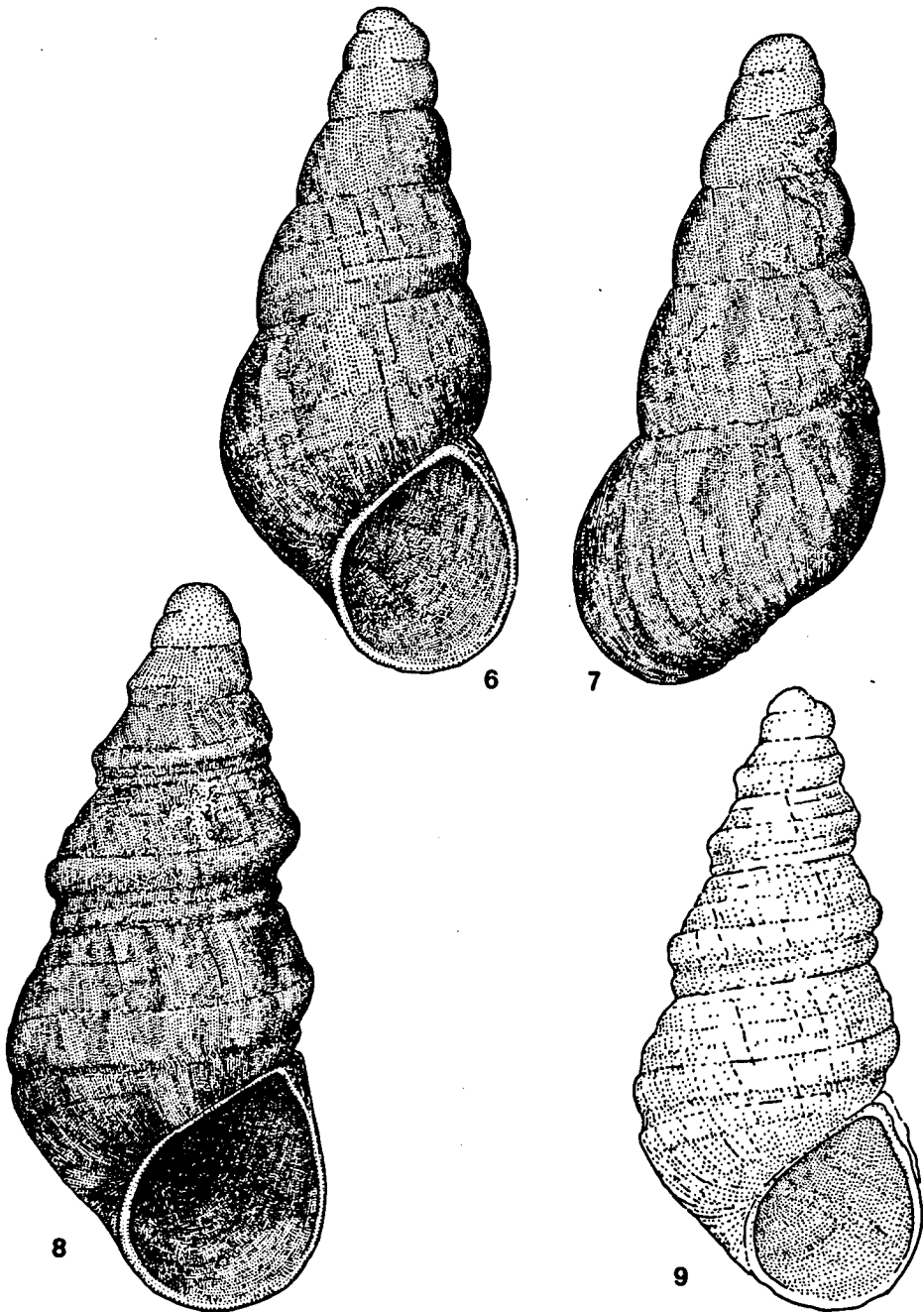
- KELLING, G., & D.J. STANLEY, 1972. Sedimentation in the vicinity of the Straits of Gibraltar. In: D.J. STANLEY, ed., *The Mediterranean Sea*: 489-519. Stroudsburg, Pa.
- PALLARY, P., 1901. Diagnoses de quelques coquilles nouvelles provenant du Maroc. — *J. Conchyl.*, Paris 49: 226-228, 314-315.
- , 1902. Liste des mollusques testacés de la baie de Tanger. — *J. Conchyl.*, Paris 50: 1-39.
- , 1920. *Exploration scientifique du Maroc*, 2me fascicule: Malacologie: 1-109. Rabat, Paris.
- PONDER, W.F., 1985. A review of the genera of the Rissoidae (Mollusca: Mesogastropoda: Rissoacea). — *Rec. Austr. Mus. Suppl.* 4: 1-221.
- VERDUIN, A., 1982. On taxonomy and variability of Recent European species of the genus *Bittium* Leach (Mollusca, Gastropoda, Prosobranchia). — *Basteria* 46: 93-120.
- WARÉN, A., 1980. Marine Mollusca described by John Gwyn Jeffreys, with the location of the type material. — *Conch. Soc. Gr. Britain Ireland, Spec. Publ.* 1: 1-60.



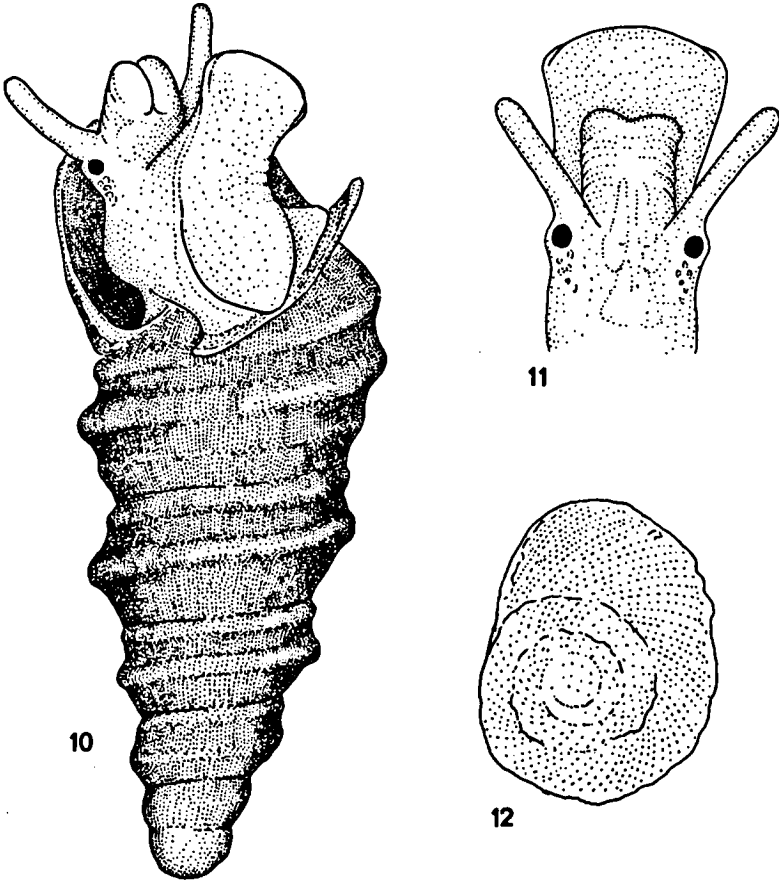
Figs. 1-3. Holotype of *Cassiella abylenis* n. sp., Benzú, infralittoral, actual length 2.2 mm (Muséum National d'Histoire Naturelle, Paris).



Figs. 4-5. *Cassiella abylenis* n. sp., paratypes, Benzú, infralittoral; 4 - actual length 2.1 mm, strongly carinate, white specimen; 5 - actual length 2.25 mm, strongly carinate specimen with distinct flames.



Figs. 6-9. *Cassiella abylenis* n. sp., paratypes; 6-7 - Sarchal, infralittoral, actual length 2 mm, smooth specimen; 8 - Sarchal, infralittoral, actual length 2.2 mm; 9 - Tangier Bay, shore drift, actual length 1.9 mm.



Figs. 10-12. *Cassiella abylenis* n. sp., Benzú, infralittoral, highly enlarged; 10 - living animal; 11 - head-foot; 12 - operculum.

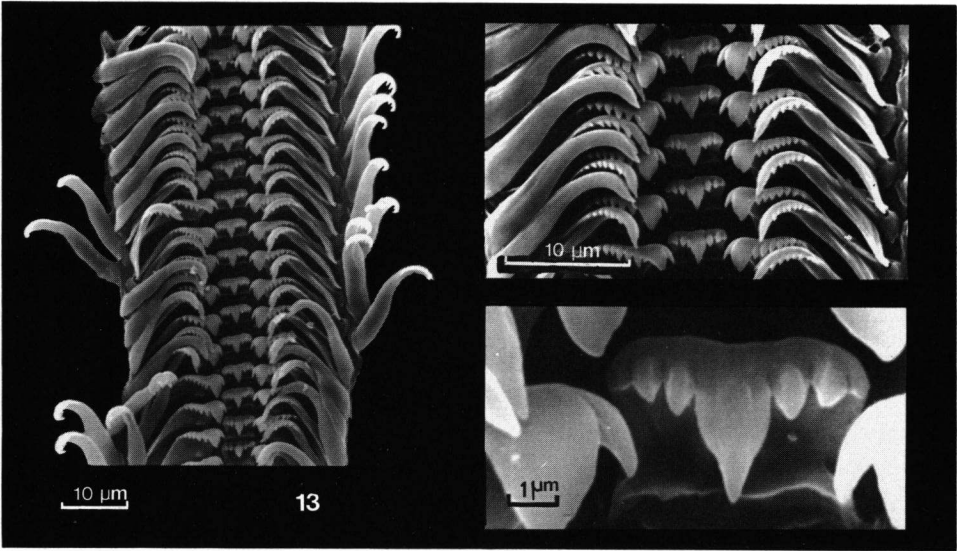
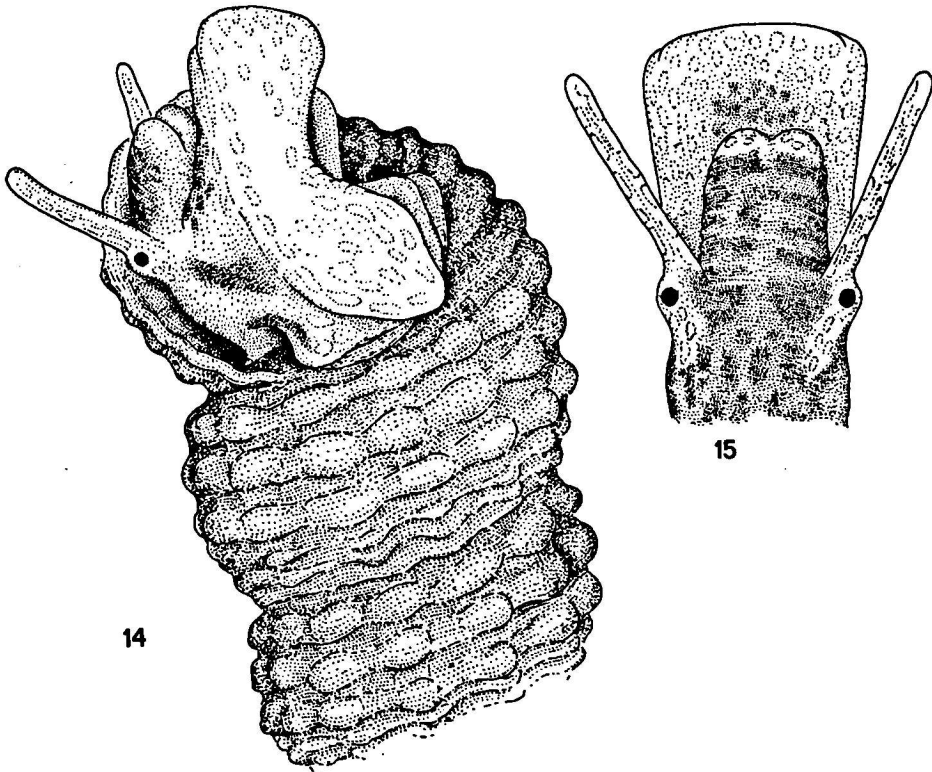
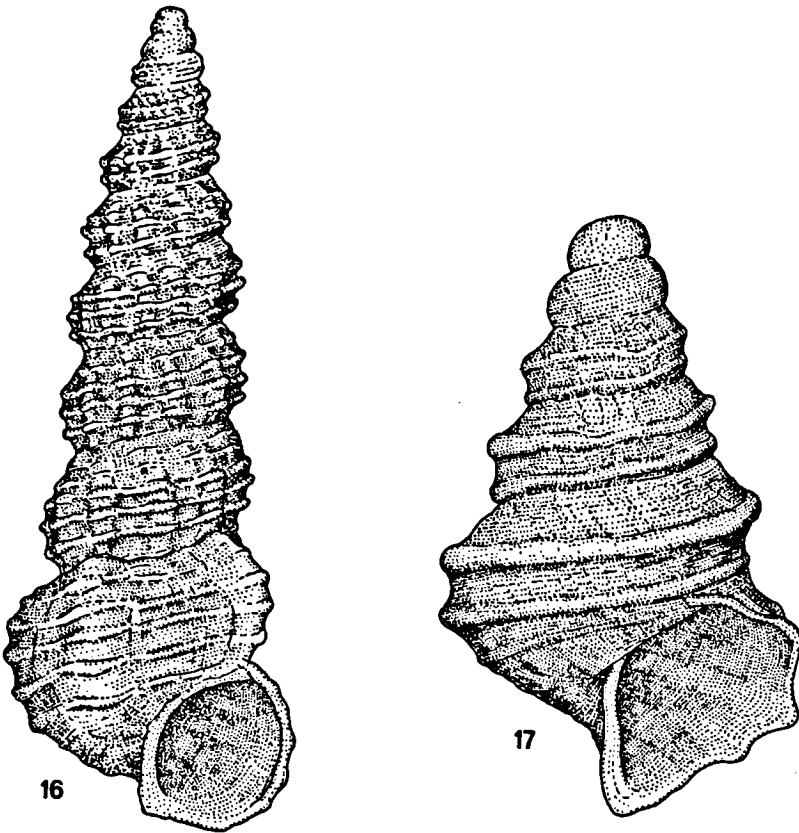
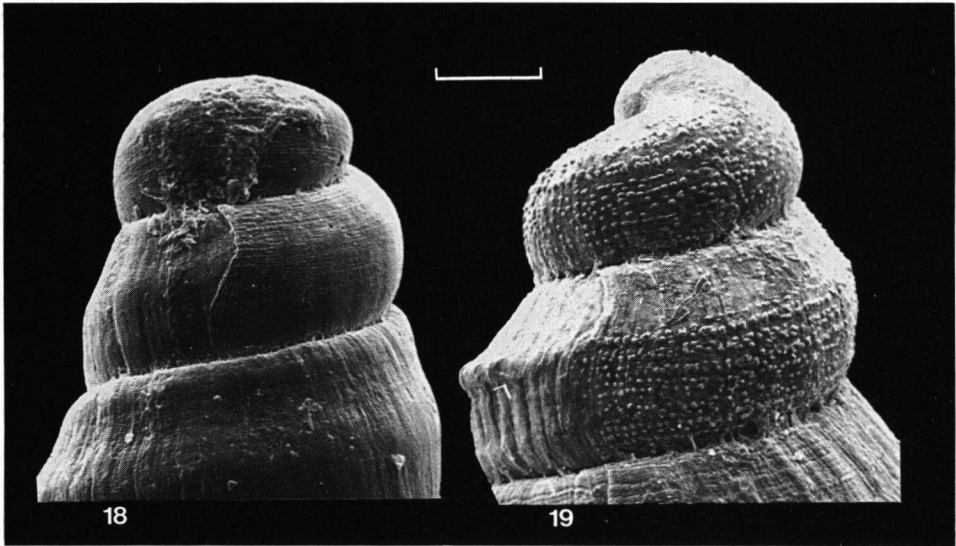


Fig. 13. *Cassiella abylenis* n. sp., Benzú, infralittoral, various details of radula.





Figs. 16-17. *Cerithidium* and *Cerithium*. 16 - Syntype of *Turritella? pusilla* Jeffreys, 1860. Recent representative of *Cerithidium* Monterosato (actual length 4.4 mm, British Museum (Natural History), London). 17 - young specimen of *Cerithium rupestre* (Risso, 1826), Benzú, infralittoral, actual length 3.3 mm.



Figs. 18-19. Protoconchs of *Cassiella abylenis* n. sp. (18) and *Cerithium rupestre* (Risso, 1826) (19) from Benzú infralittoral. Highly enlarged, scale bar 100 μ m.

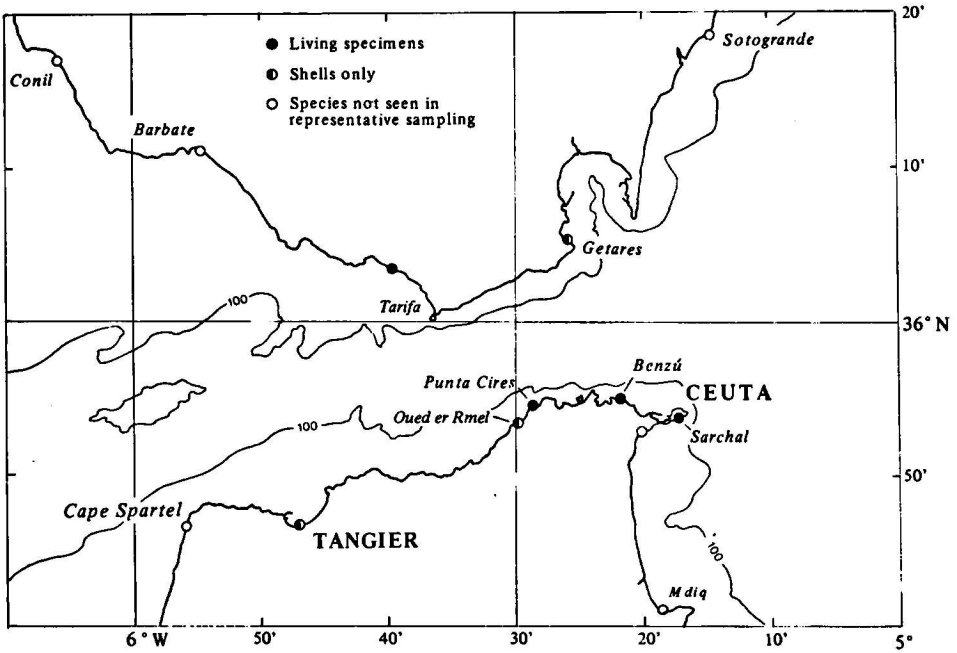


Fig. 20. Distribution of *Cassiella abylenis* n. sp.; 100 fathom depth contour after Kelling & Stanley (1972).

Bij de opmaak in de drukkerij is helaas het onderschrift van fig. 14 en 15 op p. 117 van *Basteria* Vol. 51, No. 4-6, 1987, weggefallen; U gelieve dit onderaan p. 117 in te plakken.

Unfortunately the captions of figs. 14-15 on p. 117 of *Basteria* Vol. 51, No. 4-6, 1987, have been inadvertently removed by the printers when designing the lay-out. Please insert these on p. 117.

Figs. 14-15. *Bittium reticulatum* (Da Costa, 1778), playa Benitez, Ceuta, infralittoral, highly enlarged; 14 - living animal; 15 - head-foot.