



# XENOPHORA

## TAXONOMY

Supplément à Xenophora, Bulletin de l'Association Française de Conchyliologie



### CONTENT:

|                                                                                                                                                                                                                                                       |    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <i>ATHLETA (VOLUTOSPINA) BAILI</i> NOV. SP., UNE ESPÈCE NOUVELLE DE VOLUTIDAE DU BARTONIEN (ÉOCÈNE MOYEN) DU BASSIN DE PARIS. J.M PACAUD, D. LEDON.                                                                                                   | 3  |
| WESTERN PACIFIC CERUTHIOPSIDAE PART 1: SOLOMON AND MARQUESAS ISLANDS A. CECALUPO & I. PERUGIA.                                                                                                                                                        | 11 |
| DESCRIPTION OF A NEW <i>JASPIDICONUS</i> (CONOIDEA: CONIDAE) FROM BAHIA, BRAZIL. <i>JASPIDICONUS ELENAE</i> SP NOV. GREGORIO PEREIRA DE QUEIROZ, O. CRABOS, G. S. P. OLIVEIRA.                                                                        | 18 |
| ENRICHING THE MARINE MOLLUSCS' BIODIVERSITY OF THE MEDITERRANEAN AND THE HELLENIC SEAS (04/2023) T. MANOUSIS, G. ZAMINOS, C. KONTADAKIS, G. MBAZIOS, S. GALINOU-MITSOUDI.                                                                             | 23 |
| TWO NEW SPECIES OF MARGINELLIDAE FROM NORTHEAST BRAZIL. O. CRABOS, L. PASSOS DE ALMEIDA, G. S. P. OLIVEIRA.                                                                                                                                           | 32 |
| DESCRIPTION OF TWO NEW SUBSPECIES OF <i>ANCILLA CASTANEA</i> (G. B. SOWERBY I, 1830) : <i>ANCILLA CASTANEA LUTOFLAVA</i> SP. NOV. ; <i>ANCILLA CASTANEA ALBOLUTEA</i> SP. NOV. AND NOTES ON A NEW COLOR FORM OF <i>ANCILLA CASTANEA</i> . S. MASSIMO. | 36 |
| ON THE FIRST RECORDED OCCURRENCE OF THE INVASIVE TROPICAL SNAIL <i>ALLOPEAS GRACILE</i> (T. HUTTON, 1834) (GASTROPODA, ACHATINIDAE, SUBULININAE) IN GREECE. C. ZEIMBEKIS, G. ZAMINOS, D.P. CILIA, T. MANOUSIS                                         | 43 |
| ON THE TYPE SPECIMENS OF <i>CYMBIOLA CATHCARTIAE</i> . L. AMBAR, A. MONTEIRO.                                                                                                                                                                         | 48 |



## Association Française de Conchyliologie

www.xenophora.org  
2 square La Fontaine  
75016 Paris

### Président

**Eric Monnier**

ericm2007@hotmail.fr

194 Rue du Chateau des Rentiers - 75013 PARIS

### Vice-Président & Chief Editor

**Fabrice Prugnaud**

fprugnaud@gmail.com

23 Rue des Bons Raisins - 92150 Suresnes



**XENOPHORA TAXONOMY** is a supplement to **XENOPHORA**, the quarterly bulletin published by AFC. It is shipped to all AFC members with the regular publication.

### Cover:

*Lyria pauljohnsoni*  
Poppe & Terry, 2002  
Lavanono, Madagascar 04/2014  
Photo : Eric Monnier



### Guidelines

AFC and its magazine *Xenophora Taxonomy* accept to publish taxonomic works including descriptions of new species and revisions of supraspecific groups of mollusks. The manuscripts must be in accordance with the rules and recommendations of the ICZN (International Code of Zoological Nomenclature). The manuscripts will be submitted to a board of referees before publication. Decisions to publish or not will follow careful refereeing and this committee may suggest changes to the author.

These descriptions will be sent to the Editor of *Xenophora* (redaction@xenophora.org) in English (with an abstract or introduction in French). The illustrations must be provided in high definition, by email or other digital media. Colour pictures are preferred. Captions of the figures and plates must be provided with the references to the pictures. Texts shall be provided in \*.doc, \*.txt or \*.rtf format, while the photos must be in jpg format with 300 dpi resolution. The pictures submitted can be used by *AFC-Xenophora* for any of its publication, magazine or its web-site.

Publication is free of charge for the authors. At least one of the Authors must be an AFC member. The Senior and juniors authors will receive a digital copy of the paper.

Copyright © Association Française de Conchyliologie

Reproduction in whole or part without written permission is prohibited.

# ATHLETA (*VOLUTOSPINA*) *BAILI* NOV. SP., UNE ESPÈCE NOUVELLE DE VOLUTIDAE (MOLLUSCA, GASTROPODA) DU BARTONNIEN (ÉOCÈNE MOYEN) DU BASSIN DE PARIS

Jean-Michel PACAUD

CR2P Centre de Recherche en Paléontologie – Paris  
Muséum national d'Histoire naturelle, Sorbonne Université, CNRS  
57 rue Cuvier, CP 38, 75005 Paris (France)  
E-mail : [pacaud@mnhn.fr](mailto:pacaud@mnhn.fr)

Daniel LEDON

CR2P Centre de Recherche en Paléontologie – Paris  
Muséum national d'Histoire naturelle, Sorbonne Université, CNRS  
57 rue Cuvier, CP 38, 75005 Paris (France)  
E-mail : [dnledon@yahoo.fr](mailto:dnledon@yahoo.fr)

**Résumé :** L'observation sous lumière ultraviolette des motifs colorés résiduels sur les coquilles de très nombreux gastéropodes cénozoïques fournit des caractères permettant d'affiner la description des espèces fossiles. Nous appliquons ici cette méthode à la discrimination d'une espèce d'*Athleta* du Bartonien (Eocène moyen) du bassin de Paris confondue jusqu'ici avec l'espèce « *Murex* » *suspensus* (Solander in Brander 1766) du Bartonien d'Angleterre. L'espèce *Athleta* (*Volutospina*) *baili* nov. sp. du Bartonien (Eocène moyen) du bassin de Paris est décrite.

**Mots clés :** Volutidae, Athletinae, motifs colorés résiduels, taxonomie, caractères conchiliologiques, Cénozoïque, Éocène, Bartonien, France.

**Abstract:** Observation under ultraviolet light of residual colour patterns on the shells of numerous Caenozoic Athletinae (Mollusca, Gastropoda) provides a new set of characters that can enrich and refine the description of these species. We apply this method to the discrimination of a species of *Athleta* from the Bartonian (Middle Eocene) of the Paris Basin, which was previously confused with the species "*Murex*" *suspensus* (Solander in Brander 1766) from the Bartonian of England. The species *Athleta* (*Volutospina*) *baili* nov. sp. of Bartonian (Middle Eocene) of the Paris Basin is described.

**Key words:** Volutidae, Athletinae, residual colour patterns, taxonomy, shell character, Caenozoic, Eocene, Bartonian, France.

## Introduction

À l'origine, le taxon *Murex suspensus* Solander in Brander, 1766 a été décrit (SOLANDER in BRANDER, 1766 : 32, pl. 5, fig. 70) d'après un exemplaire juvénile aux caractères incertains provenant de la Barton Clay Formation en Angleterre, probablement des lits d'argile E ou F de BURTON (1933). SOWERBY J. de C. (1823 : 137), qui renvoie à la planche 115, fig. 5 publié par SOWERBY J. (1816), BROWN (1849 : 47, n° 5, pl. 31, fig. 3), D'ORBIGNY (1850 : 353, n° 280), EDWARDS (1854 : 158, n° 96, pl. 20, fig. 4a-d), NEWTON (1891 : 139) et GLIBERT (1960 : 53) ont néanmoins appliqué le nom de Solander à une espèce très distincte de *Volutospina*, dont les individus ressemblent peu au type porte-nom. Le nom *Voluta ambigua monstrosa* Sowerby J., 1816 est disponible pour cette dernière et elle est donc traitée comme une espèce distincte (JEFFERY, 2000).

L'espèce de Solander est signalée de l'Auversien (Bartonien, Éocène moyen) du bassin de Paris par COSSMANN (1913 : 197-

198, pl. 6, fig. 205-20) qui écrit : « Quoiqu'il y ait quelques différences entre nos spécimens et les jeunes individus représentés sur les figures 4abc de la planche 20 de la Monographie d'Edwards, je n'hésite pas à les rapporter à la même espèce qui est très variable en Angleterre selon l'âge de la coquille : l'absence presque complète de sillons est peut-être due à l'usure du test ; d'autre part, le cou est certainement moins excavé chez nos spécimens, leurs plis semblent aussi moins saillants. Il est intéressant de voir cette forme, rare à Barton, reparaitre dans l'Est du Bassin de Paris, après s'être montrée dans le Nord-Ouest. Localités : Vendrest [...] Monneville ». Cependant, les spécimens [MNHN.F.J10045 et J17628 (coll. Cossmann, leg. Giroux)] assignés à *Athleta* (*Volutospina*) *suspensa* (Solander in Brander, 1766) par Cossmann ne correspond pas du tout à la coquille pour laquelle Solander a attribué ce nom.

Il est difficile de distinguer les caractères du lectotype [BMNH GG8297 (coll. Brander)] de *Murex suspensus* Solander in Brander, 1766 [CINZ (1999 : Art. 74.6) : fixation d'un lectotype pour stipulation abusive de l'existence d'un holotype par JEFFERY (2000)] de ceux des spécimens juvéniles de *Athleta* (*Volutospina*) *scalaris* (Sowerby J. de C., 1843) ou de *Athleta* (*Volutospina*) *athleta* (Solander in Brander, 1766) provenant des mêmes sédiments de la Barton Clay Formation en Angleterre. Comme ce taxon se situe dans la gamme de variabilité de ces deux espèces, il ne peut être assigné avec certitude à l'une ou à l'autre, de sorte que même si le nom est valide du point de vue nomenclatural, il constitue un synonyme potentiel et comme l'a écrit judicieusement JEFFERY (2000), ce taxon doit être considéré comme un *nomen dubium*. Le problème est renforcé par l'application de l'épithète spécifique « *suspensus* » par des auteurs ultérieurs à un taxon tout à fait distinct. Nous venons en effet de citer l'erreur de Cossmann, mais nous avons vu également (PACAUD & LAPORTE, 2015) que le taxon *Voluta suspensa* (Solander in Brander, 1766) ou *Voluta massagetes* von Eichwald, 1868 (*nomen novum* pro *Voluta suspensa* sensu Abich, 1858 [non Solander in Brander, 1766] signalé des calcaires priaboniens (Éocène supérieur) du lac d'Aral (Oural) en Russie (ABICH, 1858 ; TRAUTSCHOLD, 1859 ; DELESSE & LAUGEL, 1865 ; VON EICHWALD, 1868 ; KOROBKOV, 1955 ; ALEXEEV, 1963) correspond à *Athleta* (*Neothleta*) *suturalis* (Nyst, 1836).

En ce qui concerne l'espèce du Bartonien du bassin de Paris figurée par Cossmann, MORELLET & MORELLET (1936 : 306) écrivaient déjà : « Personnellement, nous connaissons mal l'*A. suspensa* typique anglaise. L'*A. suspensa* parisienne de Cossmann (Vendrest) pourrait bien n'être qu'une variété de *A.*

depauperata. Nous avons en effet récolté à Lévignen, outre des échantillons identiques à l'*A. suspensa* de Vendrest, de nombreux individus qui établissent le passage entre cette dernière forme et *A. depauperata* ». Puis en 1940 (p. 115, note 2) les mêmes auteurs écrivaient : « [...] Quant aux échantillons des Sables moyens (Vendrest) rapportés par Cossmann (Catalogue, app. 5, p. 183, pl. 6) à *Athleta suspensa* (Sol.), ce sont de simples variétés de *Athleta depauperata* (Sow.) ». Cependant, cette espèce, loin de ne représenter « qu'une simple variété de *Athleta depauperata* » comme l'écrivent Morellet & Morellet, en diffère par des caractères constants et présente par ailleurs un motif coloré résiduel tout à fait particulier, très nettement différent de celui observé chez *A. (V.) depauperatus* (Sowerby J. de C., 1823). De plus, et contrairement aux assertions de ces auteurs, il n'existe aucune forme de passage d'une espèce à l'autre. Nous considérons ce taxon comme une nouvelle espèce et nous en donnons ici la description.

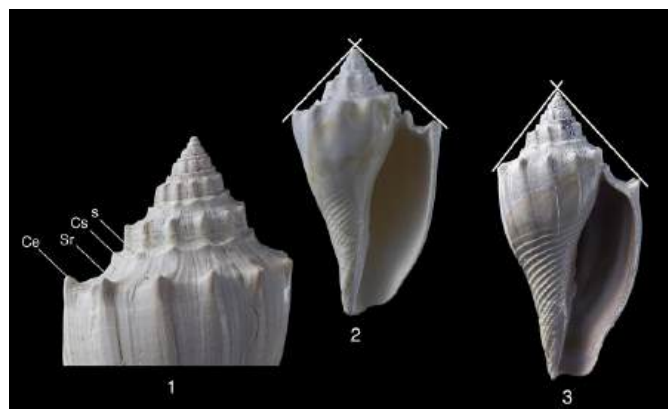
### Matériel et Méthode

L'observation et l'examen de 87 spécimens d'*Athleta (Volutospina) baili* nov. sp., et de très nombreux exemplaires d'*A. (V.) depauperatus* (Sowerby, J. de C., 1823) nous ont permis de mettre en évidence un angle particulier permettant de les distinguer sans ambiguïté. Cet angle, que nous appelons angle subapical (distinct de l'angle apical), est l'angle au sommet du cône dans lequel la coquille est incluse. En utilisant la vue ventrale, les deux côtés de l'angle sont constitués par les génératrices du cône, issues des extrémités des épines de la couronne abapicale et tangentes aux bords de l'apex. Les figures comparatives (Fig. 1.2-3) s'appuient sur des représentants de chaque espèce, de même taille. Certains caractères diagnostiques de la sculpture spirale sont codifiés en suivant la méthode introduite par MERLE & PACAUD (2014) et LOZOUET (2019) (Fig. 1.1) :

[Cs] = cordon sous-sutural, plus ou moins épineux.

[Ce] = cordon épineux de l'épaule, généralement appelé « couronne d'épines ».

[Sr] = sillon plus ou moins creux, parfois véritable rampe adapicale, encadrée par les cordons Cs et Ce.



[s] = suture.

Figure 1.

1. Terminologie utilisée pour les Athletinae : Cs (Cordon sous-sutural), Ce (Cordon d'épaule ou couronne d'épines), Sr (Sillon ou rampe encadrés par les cordons Cs et Ce), s (suture). *Athleta (Volutospina) depauperatus* (Sowerby J. de C., 1823), MNHN.F.A89319 (coll. Pacaud.). – 2-3. Valeurs de l'angle subapical : 2. *Athleta (Volutospina) baili* nov. sp. = 95°, holotype MNHN.F.A89219 (coll. Pacaud.). – 3. *Athleta (Volutospina) depauperatus* (Sowerby J. de C., 1823) = 80°.

MNHN.F.A89319 (coll. Pacaud.).

Nous avons également préparé tous ces spécimens dans un bain d'hypochlorite de sodium concentré pendant 24 heures ; les résidus de pigments, oxydés, se trouvent ainsi révélés par fluorescence lorsque les coquilles sont exposées sous une lampe émettant une lumière UV à ondes longues (longueur d'ondes de 3600 Å) nous permettant de décrire le motif résiduel de couleur. Ces motifs résiduels apparaissent clairs et fluorescents sur un fond sombre. Les coquilles sont par la suite lavées abondamment pour éviter tout dépôt de sodium. Nous précisons une fois encore que les couleurs résiduelles, observées et photographiées sous UV, ne sont pas les couleurs d'origine. Le matériel décrit ici est conservé dans la Collection de Paléontologie du Muséum national d'Histoire naturelle à Paris.

### Abréviations

**BMNH** British Museum (Natural History), Londres, Angleterre.

**IRScNB** Institut royal des Sciences naturelles de Bruxelles, Belgique.

**MNHN.F** Muséum National d'Histoire Naturelle, Collection de Paléontologie, Paris, France.

### Systématique

Super-famille **Muricoidea** Rafinesque, 1815

Famille Volutidae Rafinesque, 1815

Sous-famille Athletinae Pilsbry & Olsson, 1954

Genre ***Athleta*** Conrad, 1853

Sous-genre ***Volutospina*** Newton, 1906

Espèce-type : *Conus spinosus* Linnaeus, 1758 (par désignation originale)

Origine : Lutétien (Éocène moyen), France

### *Athleta (Volutospina) baili* nov. sp.

Pl. 1, fig. 1-2, 4 – Pl. 2, fig. 4

### Synonymie

*Athleta (Volutospina) suspensa* sensu Cossmann, 1913 : 197-198, pl. 6, fig. 205-20 [non *Murex suspensus* Solander in Brander, 1766]

*Athleta depauperata* var. Morellet & Morellet, 1936 : 306. – Morellet & Morellet, 1940 : 115, note 2 [non *Voluta depauperatus* Sowerby, J. de C., 1823]

*Athleta (Volutospina) [sic] suspensa* sensu Glibert, 1960 : 53 (partim) [non *Murex suspensus* Solander in Brander, 1766]

*Athleta (Volutospina) suspensus* sensu Dolin et al., 1980 : 33. – sensu Le Renard & Pacaud, 1995 : 119, n° 205-D. – sensu Pacaud & Le Renard : 166, n° 205-D [non *Murex suspensus* Solander in Brander, 1766]

*Volutospina monstrosa* sensu Jeffery, 2000 : 36 (partim) [non *Voluta ambigua monstrosa* Sowerby J., 1816]

**Matériel type** : Holotype MNHN.F.A89219 (coll. Pacaud). – Paratypes : Baron, Sablière Heudebert (Oise) : 11 ex., MNHN.F.A89220, A89221 et A89258 (coll. Pacaud). – Vendrest (Seine-et-Marne) : 3 ex., MNHN.F.J10045 et J17628 (coll.

Cossmann).

**Localité type** : Baron, Sablière Heudebert (Oise), Auversien (Bartonien, Éocène moyen).

**Dimensions** (Holotype) : Hauteur : 38,1 mm ; Diamètre : 21,4 mm.

**Étymologie** : Espèce dédiée à notre ami Patrice Bail qui vient de nous quitter.

**Autre matériel examiné** : Baron (Oise) : 3 ex. (coll. Ledon), 10 ex., MNHN.F.A89257 (coll. Faullummel), 4 ex., MNHN.F.A74287 (coll. Pons). — Barisseuse, Saint-Vaast-lès-Mello (Oise) : 5 ex., MNHN.F.A89254 (coll. Pacaud), 1 ex. (coll. Ledon). — Le Guépelle, Saint-Witz (Val d'Oise) : 6 ex., MNHN.F.A89222 (coll. Pacaud), 9 ex., MNHN.F.A74290 (coll. Pons), 1 ex. (coll. Ledon). — Le Quoniam, Haravilliers (Val d'Oise) : 1 ex., MNHN.F.A89226 (coll. Pacaud). — Bézu-le-Guéry (Aisne) : 10 ex., MNHN.F.A89256 (coll. Faullummel), 4 ex. (coll. Ledon). — Mary-sur-Marne (Seine-et-Marne) : 2 ex., (MNHN.F.A89255 (coll. Pacaud), 6 ex., MNHN.F.A88071 (coll. Faullummel). — Caumont, Sainte-Aulde (Seine-et-Marne) : 5 ex., MNHN.F.A89223 (coll. Pacaud). — Le Limon (Seine-et-Marne) : 1 ex., MNHN.F.A89304 (coll. Pacaud). — Crouy-sur-Ourcq (Seine-et-Marne) : 2 ex., MNHN.F.A89225 (coll. ex-Galerie de Zoologie). — Coulombs-en-Valois (Seine-et-Marne) : 2 ex., MNHN.F.A89224 (coll. ex-Galerie de Zoologie).

**Description** : la coquille est de taille moyenne, oblongue, biconique, à test épais, ayant un angle subapical de 95°. Elle présente une protoconque de 2 tours et une téléconque de 4 tours croissant régulièrement. La protoconque, haute, paucispirale, présente des tours convexes et lisses. La transition protoconque/téléconque est indistincte. Les 2 premiers tours adultes sont légèrement convexes et ornés de 5 cordons spiraux recoupés par des côtes axiales, nettement plus fortes, 16 sur le premier tour et plus que 14 dès le 2e tour ; l'ensemble forme un treillis avec de faibles granules aux intersections. Sur le premier tour, les cordons [Cs] (le long de la suture adapicale) et [Ce] sont peu saillants, séparés par un sillon étroit [Sr]. Sur le deuxième tour, [Cs] est déjà plus saillant, [Ce] a encore une position postérieure et devient épineux et [Sr] s'élargit et prend la forme d'une rampe adapicale. Dès le 3e tour adulte, [Cs] s'éloigne de la suture [s], surplombant légèrement celle-ci, créant un canal et se transforme en une carène ornée de petites épines légèrement saillantes dans le prolongement des côtes ; [Cs] est situé à la périphérie adapicale et masque la suture. Le cordon [Ce] devient particulièrement épineux ; le nombre de côtes est moins important (env. 10). L'intervalle entre [Cs] et [Ce] augmente et forme une rampe adapicale [Sr] inclinée à 30°. Les tours deviennent alors étagés, la partie abapicale des tours est inclinée, noyée sous le vernis et les stries d'accroissement du sinus labral. La suture est nettement visible, linéaire. Sur le dernier tour, le cordon [Cs], surélevé, caréné et orné de pointes émoussées, surplombe la suture. L'intervalle entre [Cs] et la suture [s] devient nettement canaliculé. [Ce] délimite une large rampe suturale ; il est orné d'épines plus fortes. Le dernier tour occupe les 3/4 de la hauteur totale, il compte environ 10 côtes se prolongeant à peine en avant. La rampe suturale est large et présente dans la région abapicale un cordon [Ce] orné de fortes épines, émoussées, d'orientation adapicale et d'un fin cordon dans la région adapicale. Le dernier tour est large dans sa partie postérieure, lisse, atténué au niveau du cou et ornée dans cette région d'environ 13 stries décurrentes. Ouverture oblongue, moyennement large en arrière, étroite et peu profondément

échancrée en avant. Canal siphonal court, large. La columelle porte 2 plis, l'antérieur très saillant, l'autre plus petit ; le reste de la columelle présente des reliefs pliciformes plus atténués, formés par le prolongement des stries décurrentes du cou. Le bord de l'ouverture présente deux callosités columellaires distinctes et superposées : l'une luisante, brunâtre, très largement étalée latéralement, s'arrêtant en hauteur dans la zone pariétale, noyant les fortes épines proches de l'ouverture (elle est dense mais laisse entrevoir les stries décurrentes) ; l'autre, terne, d'une couleur blanchâtre, s'étale en partie, de l'angle pariétal à l'épine la plus proche de l'ouverture et en partie, longeant la columelle, étroite et limitée en dehors par une légère dépression. Labre peu épais, orthocline, lisse à l'intérieur. Le motif de couleur résiduel observé sous éclairage UV est constitué de bandes spirales, claires et fluorescentes, sur un fond sombre. Sur le dernier tour, le motif est constitué de bandes spirales qui suivent les stries décurrentes. Elles sont très fines, continues, d'épaisseur égale, très serrées et régulièrement espacées. Dans le tiers adapical du dernier tour, on distingue une bande spirale, large, continue et nette, dénuée de bandes spirales claires et fluorescentes. La rampe spirale ne montre aucun motif. Les parties médiane et abapicale présentent, sur les exemplaires les mieux préservés, une quarantaine de bandes spirales très fines, très serrées et régulièrement espacées. On distingue également un large ruban spiral clair et fluorescent dans la zone adapicale du dernier tour, noyant les épines de la couronne abapicale et leur intervalle et sur toute l'étendue du bourrelet adapical, caréné et orné de pointes émoussées.

#### Discussion :

En moyenne, cette espèce présente une taille inférieure à celle des autres *Volutospina* signalés à l'Auversien (Bartonien, Éocène moyen) du bassin de Paris, telles que *Athleta (Volutospina) depauperatus* (Sowerby J. de C., 1823), *A. (V.) scalaris* (Sowerby J. de C., 1843), *A. (V.) ambiguus* (Solander in Brander, 1766), *A. (V.) athleta* (Solander in Brander, 1766), *A. (V.) barrandii* (Deshayes, 1865) et *A. (V.) monstrosus* (Sowerby J., 1816). Elle diffère de *A. (V.) depauperatus*, espèce syntopique dans de nombreux gisements bartoniens (Pl. 1, fig. 3 et 5), malgré les variations de cette espèce, soit pour la longueur de la spire, soit pour l'ornementation du dernier tour, par une coquille nettement biconique, par un angle subapical plus obtus de 95° (contre 80° chez *A. (V.) depauperatus*), par des tours plus hauts, par un dernier tour plus large dans sa partie adapicale, lisse, atténué au niveau du cou et uniquement orné dans cette région d'environ 13 stries décurrentes, par une rampe suturale [Sr] moins large, par une sculpture axiale plus forte, aux côtes moins nombreuses, plus larges, plus espacées. Le cordon [Cs] est nettement surélevé, caréné et orné de pointes émoussées ; il surplombe la suture. L'intervalle entre [Cs] et la suture [s] devient nettement canaliculé. Le motif de couleur résiduel observé sous éclairage UV est très nettement différent. Celui de *A. (V.) depauperatus* est constitué de rares bandes spirales, claires et fluorescentes, sur un fond sombre, très espacées (Pl. 1, fig. 5), à la différence du motif de *A. (V.) baili* nov. sp. qui est constitué d'un plus grand nombre de bandes spirales fluorescentes, bien plus fines, d'épaisseur égale, très serrées et plus régulièrement espacées (Pl. 1, fig. 4). On distingue également un alignement spiral de taches claires et fluorescentes noyant largement les épines de la couronne [Ce] du dernier tour ainsi que les intervalles de ces dernières. Par ailleurs, dans le tiers adapical du dernier tour, on distingue une bande spirale,

large, continue et nette, dénuée de bandes spirales claires et fluorescentes, alors que chez *A. (V.) depauperatus* le motif est continu, jusqu'au cordon de l'épaule [Ce] et ne montre aucun alignement spiral de taches claires et fluorescentes au niveau des épines de la couronne [Ce].

*A. (V.) monstrosus* (Sowerby J., 1816) du Bartonien d'Angleterre [lectotype BMNH 43804 (coll. Sowerby J.) – CINZ (1999 : Art. 74.6) : fixation d'un lectotype pour stipulation abusive de l'existence d'un holotype par JEFFERY (2000) ; MNHN.F.J17627 et 17629 (coll. Cossmann) (Pl. 2, fig. 1)] est également signalé au Bartonien dans le bassin de Paris (Pl. 2, fig. 2-3) par de rares spécimens de l'Auverisien de Baron (Oise) [MNHN.F.A74286 (coll. Pons)] et du Marinésien du Quoniam, Haravilliers (Val d'Oise) [MNHN.F.A46044 et A89318 (coll. Pacaud), A74288 (coll. Pons)]. Elle diffère de *A. (V.) baili* nov. sp. par une taille plus grande, par une coquille au galbe moins biconique, au dernier tour plus renflé, plus fortement canaliculée au niveau du cordon [Cs], par une sculpture spirale plus nettement marquée et qui orne toute la surface du dernier tour, jusqu'au cordon [Ce], aux côtes plus minces, moins épineuses adapicalement.

GLIBERT (1938 : 115-116, pl. 4, fig. 8) écrit à propos de l'espèce *Athleta (Neoathleta) spinicosta* du Bartonien (Wemmelen, Éocène moyen) de Neder-Over-Heembeek (Belgique) qu'il introduit [*Athleta spinicosta* Vincent & Rutot, 1879, 1881 et 1883 est un *nomen nudum*] : « C'est une forme à rampe suturale profondément creusée, comme *A. suspensa* de Barton, mais ne présentant, à part cela, avec cette dernière aucune analogie ». L'espèce belge [Holotype IRSNB 00342] diffère essentiellement de *A. (V.) baili* nov. sp. par ses dimensions plus faibles, par son galbe allongé, ovoïde, peu ventru, par son unique cordon [Ce], surplombant une rampe suturale étroite et profondément canaliculée, séparé du reste de la coquille par un sillon transverse, par ses côtes plus nombreuses, orné d'épines étroites, élevées (Pl. 2, fig. 5).

## Conclusion

Comme nous l'avons maintenant écrit à plusieurs reprises (PACAUD, 2003, 2007 ; PACAUD & CAZE, 2011 ; PACAUD & PONS, 2013 ; PACAUD & LEDON, 2014 ; PACAUD & CAZES, 2014 ; PACAUD & LAPORTE, 2015 ; PACAUD *et al.* 2015 ; PACAUD, 2016 ; 2017a.b.c ; 2018 ; 2021 ; PACAUD & VICIÁN, 2019 ; PACAUD & SAUTEREAU, 2020), l'utilisation des motifs colorés résiduels observés sous éclairage UV joue un rôle particulièrement pertinent dans la discrimination des espèces de l'Éocène du bassin de Paris. L'observation de ces motifs est considérée comme une approche complémentaire pour accéder à la variabilité intraspécifique. Les informations apportées ici dans l'observation de coquilles fossiles du sous-genre *Volutespina*, même si les motifs résiduels appartiennent à un même type de motif (bandes spirales fluorescentes claires sur un fond sombre) permettent ainsi, en l'absence d'intermédiaires entre les motifs, de confirmer la séparation des taxons *A. (V.) baili* nov. sp. et *A. (V.) depauperatus* (Sowerby J. de C., 1823) que les caractères conchyliologiques nous permettaient déjà d'établir. Si l'on prend appui sur les espèces récentes, il existe une grande variabilité intra-spécifique chez certaines espèces, en particulier sur la hauteur de la spire ou la prééminence des sculptures ; l'angle subapical peut être considéré comme une valeur d'appoint. Toutefois, les ornements et angles subapicaux des espèces décrites ici sont des caractères robustes et discriminants, des

critères spécifiques stables permettant de séparer ces taxons. Les Volutidae actuels présentent des éléments de motifs de couleur sombres contrastant avec un fond plus clair. Nous donnons ici une reconstitution (Pl. 3, fig. 4 et 6) de l'aspect natif de ces 2 espèces cénozoïques, laissant libre cours à notre imagination quant à la couleur que ces espèces devaient avoir.

## Remerciements

Nous remercions Lilian Cazes et Philippe Loubry (MNHN/CNRS) pour les photographies, pour les prises de vue sous éclairage UV et pour l'infographie des planches.

## Références

- ABICH, H., 1858. Beiträge zur Paläontologie des Asiatischen Rußlands. *Mémoires de l'Académie des Sciences de Saint-Petersbourg. Sciences mathématiques et physiques*, 6 (7) : 537-577, pl. 1-8. [Également publié par ABICH, H., 1858. *Beiträge zur Paläontologie des Asiatischen Rußlands*. Kaiserlichen Akademie der Wissenschaften, Saint Petersburg, 41 p. 8 pls.]
- ALEXEEV, A.K., 1963. *Paleogenovaja Fauna Molluskov severogo Priaral'ja [Paleogene Molluscan Fauna of the Northern Urals Region]*, Akademija Nauk Armanskoj SSR, Yerevan, 176 p., 24 pls.
- BROWN, T., 1849. *Illustrations of the fossil conchology of Great Britain and Ireland, with descriptions and localities of all the species*. Smith, Elder, and Co., London and MacLachlan and Stewart, Edinburgh. viii + 273 p., 98 pls.
- BURTON, E. St J., 1933. Faunal horizons of the Barton Beds in Hampshire. *Proceedings of the Geologists' Association*, 44 (2) : 131-167.
- COSSMANN, M., 1913. Appendice n° 5 au Catalogue illustré des coquilles fossiles de l'Éocène des environs de Paris. *Annales de la Société royale Zoologique et Malacologique de Belgique*, 49 : 19-238, pl. 1-8, text-figs. 1-154. [Également publié par COSSMANN, M., 1913 (octobre) : *Catalogue illustré des coquilles fossiles de l'Éocène des environs de Paris faisant suite aux travaux paléontologiques de G.-P. DESHAYES*. Appendice n° 5, Société royale Malacologique de Belgique, Bruxelles, 224 p., 8 pls, 154 text-figs.]
- DELESSE, A.-J. & LAUGEL, A., 1865. *Revue de géologie pour les années 1862 et 1863. Volume 3*, Dunod, Paris, 412 p.
- DOLIN, C., DOLIN, L. & LE RENARD, J., 1980. Inventaire systématique des Mollusques de l'Auverisien à « faciès charrié » de Baron (Oise), et remarques paléontologiques. *Bulletin d'Information des Géologues du bassin de Paris*, 17 (2) : 26-48, fig. 13, pl. 1-3.
- EDWARDS, F.E., 1854a. A Monograph of the Eocene Mollusca, or descriptions of shells from the older Tertiaries of England. Part 3.1: Prosobranchiata, *Monographs of the Palaeontographical Society* : 121-180, pl. 16-23.
- VON EICHWALD, C.E., 1868. *Lethaea rossica ou paléontologie de la Russie : Seconde Section de la Période moyenne, contenant la fin des Mollusques, les Céphalopodes, les Crustacés, les*

*Insectes, Les Poissons et les Reptiles*, Schweizerbart, Stuttgart, 641-1304.

GLIBERT, M., 1960. Les Volutacea fossiles du Cénozoïque étranger des collections de l'Institut royal des Sciences Naturelles de Belgique. *Mémoires de l'Institut Royal des Sciences Naturelles de Belgique*, 2 (61) : 1-109.

I.C.Z.N., 1999. *International Code of Zoological Nomenclature (Fourth edition)*. The Natural History Museum. Cromwell Road, London, 306 p.

JEFFERY, P., 2000. The statut of *Murex suspensus* Solander in Brander, 1766 (Volutidae: Athletinae) and *Voluta ambigua* var. *monstrosa* J. Sowerby, 1816, from the middle Eocene of Barton on Sea, Hampshire. *Tertiary Research*, 20 (1-4) : 33-36, pl. 1-2.

KOROVKOV, I.A., 1955. *Spravochnik I methodicheskoe revodstvo po tretichnym molliuskam. Briuckhonologie [Reference and methodological guide to Tertiary mollusks. Gastropoda]*, Gostoptekizdat, Moscou, 795 p., 261 text-fig., 117 pls, 18 tabl. [En russe].

LE RENARD, J. & PACAUD, J.-M., 1995. Révision des Mollusques paléogènes du Bassin de Paris. 2: Liste des références primaires des espèces. *Cossmanniana*, 3 (3) : 65-132.

MERLE, D. & PACAUD, J.-M., 2014. Systematics. In : MERLE, D., PACAUD, J.-M., METAIS, G., BARTOLINI, A., LASHARI, R.A., BROHI, I.A., SOLANGI, S.H., MARIVAUX, L. & WELCOMME, J.-L. 2014. Volutidae (Mollusca: Gastropoda) of the Lakhra Formation (Earliest Eocene, Sindh, Pakistan): systematics, biostratigraphy and paleobiogeography. *Zootaxa*, 3826 (1) : 107-138, fig. 1-12.

MORELLET, L. & MORELLET, J., 1936. Faune des sables à *Nummulites variolarius* de Lévis (Oise). *Bulletin du Muséum National d'Histoire Naturelle*, 2<sup>ème</sup> série, 8 (3) : 292-310.

MORELLET, L. & MORELLET, J., 1940. Les diverses interprétations du terme de «Bartoniien». *Bulletin de la Société Géologique de France*, 5 (10) : 105-119.

NEWTON, R.B., 1891. *Systematic list of the F. E. Edwards collection of British Oligocene and Eocene mollusca in the British Museum (Natural History), with references to the type-specimens from similar horizons contained in other collections belonging to the Geological Department of the Museum*. London, British Museum, xxviii + 365 p.

ORBIGNY, A., d' 1850. *Prodrome de Paléontologie stratigraphique universelle des Animaux mollusques et rayonnés faisant suite au cours élémentaire de Paléontologie et de géologie stratigraphiques*, vol. 2, Masson, Paris, 428 p.

PACAUD, J.-M., 2003. First fossil records of the Recent Ovulid genus *Pseudocypraea* Schilder, 1927 (Mollusca: Gastropoda) with description of a new species. *Geodiversitas*, 25 (3) : 451-462, text-fig. 1-6.

PACAUD, J.-M., 2007. Nouveautés nomenclaturales et taxonomiques introduites par Alcide d'Orbigny dans le Prodrome (1850, 1852) pour les espèces du Paléocène et de l'Éocène.

*Geodiversitas*, 29 (1) : 17-85, text-fig. 1-14, tabl. 1-4.

PACAUD, J.-M., 2016. Découverte du matériel type de *Niso eburnea* Risso, 1826, espèce type du genre *Niso* Risso, 1826 et implications taxonomiques. *Bulletin de la Société Géologique de France*, 187 (1) : 55-62, fig. 1-2, pl. 1.

PACAUD, J.-M., 2017b. Nouvelle observation du motif résiduel de couleur préservé chez *Athleta (Volutocorbis) suturalis* (Nyst, 1836) (Mollusca, Gastropoda, Volutidae) des sables priaboniens (Éocène supérieur) de Dnipro (Oblast de Dnipropetrovsk, Ukraine). Міжнародна науково-технічна конференція. РОЗВИТОК ПРОМИСЛОВОСТІ ТА СУСПІЛЬСТВА : 73-75, fig. 1a-b.

PACAUD, J.-M., 2017c. НОВЫЕ ДАННЫЕ ОБ ОКРАСКЕ, СОХРАНИВШЕЙСЯ НА РАКОВИНАХ *Athleta (Volutocorbis) suturalis* (NYST, 1836) (MOLLUSCA, GASTROPODA, VOLUTIDAE) ИЗ ПРИАБОНА (ВЕРХНИЙ ЭОЦЕН) г. ДНЕПРА (ДНЕПРОПЕТРОВСКАЯ ОБЛАСТЬ, УКРАИНА). Міжнародна науково-технічна конференція. РОЗВИТОК ПРОМИСЛОВОСТІ ТА СУСПІЛЬСТВА, Секція 5, Геологія і прикладна мінералогія : 76-77, fig. 1a-b.

PACAUD, J.-M., 2017d. *Trahaldia*, un nouveau genre de Columbelloidea (Gastropoda : Neogastropoda) de l'Éocène moyen du bassin de Paris. *Xenophora Taxonomy*, 16 : 3-8, fig. 1-2, pl. 1-2.

PACAUD, J.-M., 2018. Les Cypraeoidea (Mollusca, Caenogastropoda) du Priabonien (Éocène supérieur) de Dnipro (Oblast de Dnipropetrovsk, Ukraine). Partie 2 : Ovulidae (le genre *Projenneria* Dolin, 1997). *Xenophora Taxonomy*, 21 : 11-21, fig. 1-2, pl. 1-3.

PACAUD, J.-M., 2021. Présence du Rostellariidae *Rimella rimosa* (Solander in Brander, 1766) (Mollusca : Stromboidea) au Priabonien (Éocène supérieur) de Dnipro (Oblast de Dnipropetrovsk, Ukraine). ПРЕДСТАВИТЕЛИ Rostellariidae *Rimella rimosa* (Solander in Brander, 1766) (Mollusca : Stromboidea) ИЗ ПРИАБОНА (ВЕРХНИЙ ЭОЦЕН) ДНЕПРА (ДНЕПРОПЕТРОВСКАЯ ОБЛАСТЬ, УКРАИНА). *Belokrysiya*, 1 : 1-12, fig. 1-3.

PACAUD, J.-M. & CAZE, B. 2011. Une espèce nouvelle de Rostellariidae (Mollusca, Gastropoda, Littorinimorpha) dans le Lutétien (Éocène moyen) du bassin de Paris. Redécouverte du matériel type de *Hippochrenes fissura* (Coquebert de Montbret & Brongniart, 1793). *Cossmanniana*, 13 : 21-31, pl. 1-4.

PACAUD, J.-M. & CAZES, L., 2014. Motif coloré résiduel préservé sur des coquilles du genre *Bullia* Gray in Griffith & Pidgeon, 1833 (Mollusca : Gastropoda) de l'Éocène moyen du bassin de Paris et des Etats-Unis. *Xenophora*, 147 : 16-22, text-fig. 1-2, pl. 1-2.

PACAUD, J.-M. & LAPORTE, J. 2015. Première occurrence de l'espèce du Rupélien (Oligocène inférieur) de Belgique *Athleta (Volutocorbis) suturalis* (Nyst, 1836) dans les sables bartoniens (Éocène moyen) du bassin de Paris. *Xenophora*, 151 : 18-24, text-fig. 1-3.

PACAUD, J.-M. & LEDON, D., 2014. Révision des Mollusques de l'Éocène de Blaye (Gironde). 4. Description d'une espèce nouvelle de *Pachycrommium* (Gastropoda, Caenogastropoda, Ampullinidae). Notes taxonomiques et nomenclaturales sur quelques Ampullinidae avec la description de trois espèces nouvelles. *Bulletin de la Société Linnéenne de Bordeaux*, 149, 42 (2) : 183-198, pl. 1-7.

PACAUD, J.-M., LEDON, D. & LOUBRY, P., 2015. Les Plesiotritoninae (Mollusca : Gastropoda : Cancellariidae) de l'Éocène du bassin de Paris, du Cotentin, de Loire-Atlantique et d'Aquitaine. *Palaeontos*, 27 : 65-119, text-fig. 1-6, tabl. 1-6, pl. 1-12.

PACAUD, J.-M. & LE RENARD, J., 1995. Révision des Mollusques paléogènes du bassin de Paris. 4: Liste systématique actualisée. *Cossmanniana*, 3 (4) : 151-187.

PACAUD, J.-M. & PONS, J. 2013. Contribution des motifs résiduels de couleur dans la discrimination des espèces d'Athletinae (Mollusca : Gastropoda) de l'Éocène du bassin de Paris. *Fossiles. Revue française de paléontologie*, 16 : 21-39, pl. 1-8, text-fig. 1-6.

PACAUD, J.-M. & SAUTEREAU, F., 2020. Contribution des motifs résiduels de couleur dans la discrimination d'espèces nouvelles de *Cryptochorda* Mörch, 1858 (Mollusca : Gastropoda : Harpidae) de l'Éocène du bassin de Paris et du Cotentin. *Geodiversitas*, 42 (29) : 559-595, fig. 1-14.

PACAUD, J.-M. & VICIÁN, Z. 2019. Description of a new species of *Subepona* Dolin & Lozouet, 2004 (Mollusca: Cypraeoidea) from the Lutetian (Middle Eocene) of Hungary. *Fragmenta Palaeontologica Hungarica*, 35 : 103-110, fig. 1-15.

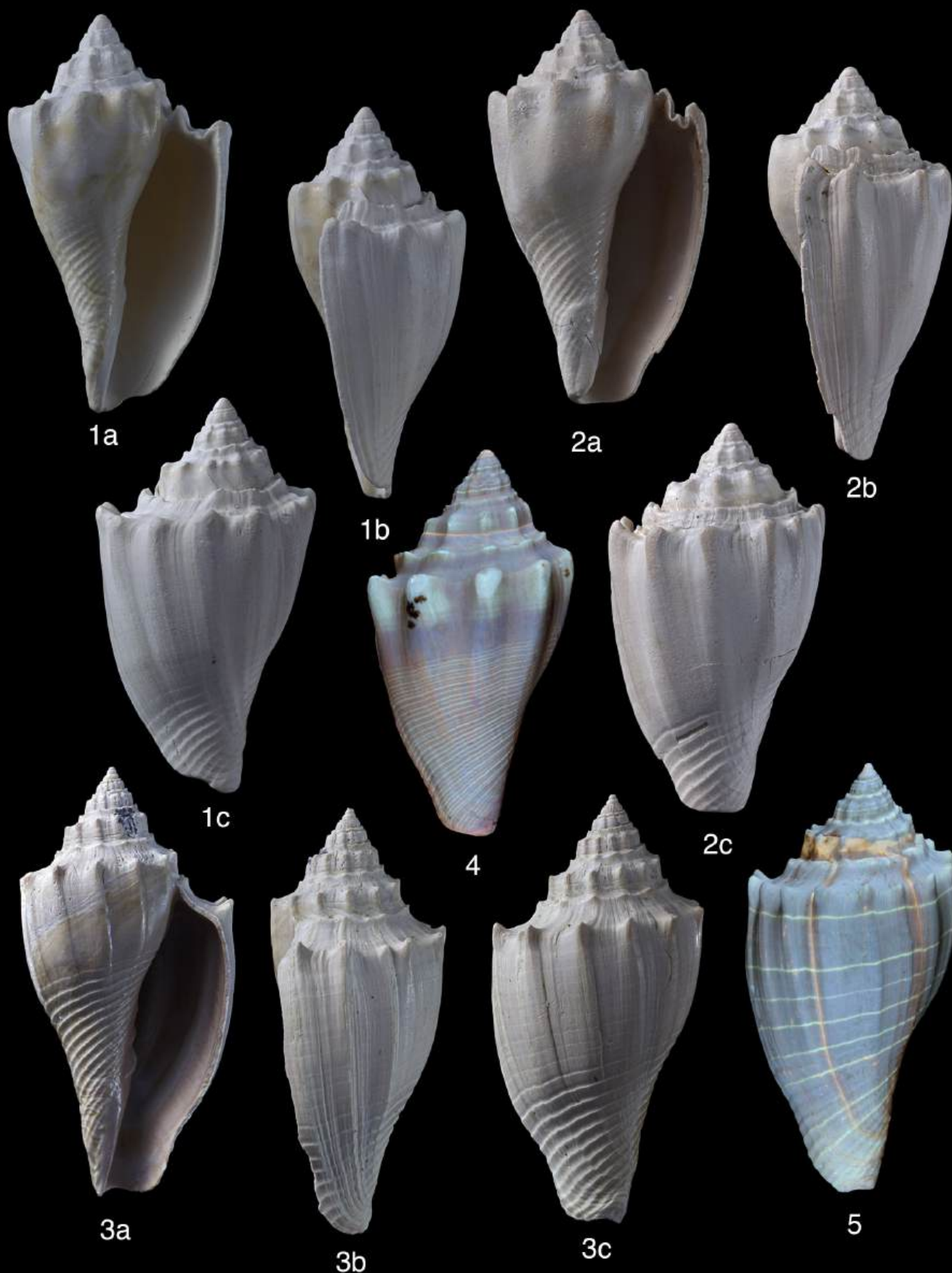
SOLANDER, D.C., 1766. *Descriptiones Specierum*. In: BRANDER, G., *Fossilia Hantoniensia collecta, et in Musaeo Brittannico deposita*, London, vi + 43 p., 9 pls.

SOWERBY, J., 1816. *The Mineral Conchology of Great Britain or coloured figures and descriptions of those remains of testaceous animals or shells, which have been preserved at various times and depths in the earth*, London, vol. 2, Part. 21 : 29-44, pl. 115-120.

SOWERBY, J. DE C., 1823. *The Mineral Conchology of Great Britain or coloured figures and descriptions of those remains of testaceous animals or shells, which have been preserved at various times and depths in the earth*, London, vol. 4, Part. 69 : 131-138, pl. 395-400.

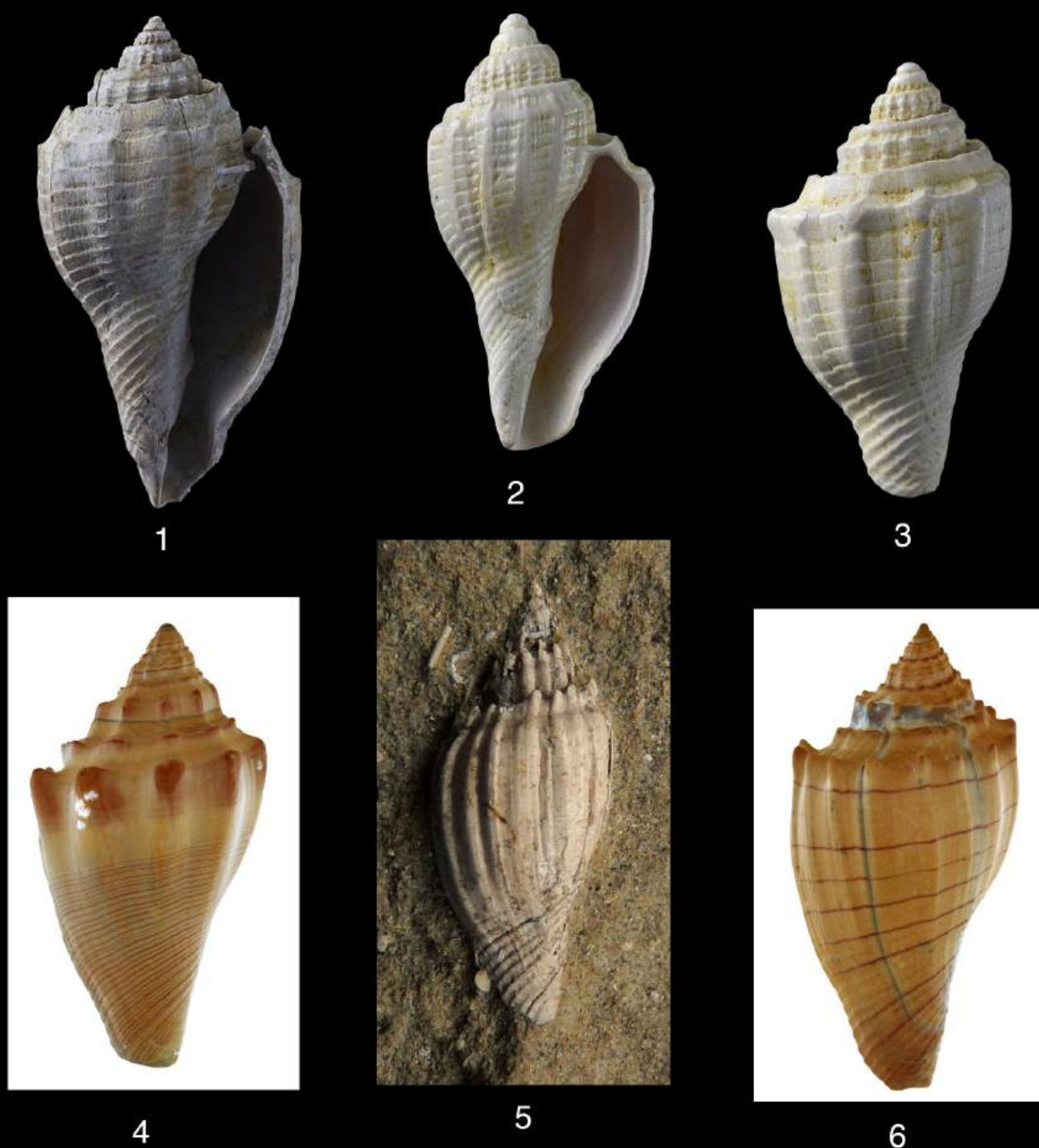
TRAUTSCHOLD, H., 1859. Ueber petrefakten von Aralsee. *Bulletin de la Société Impériale des Naturalistes de Moscou*, 32 : 303-322, pl. 4-6.

Planche 1.



1-2 et 4. *Athleta (Volutospina) baili* nov. sp. de l'Auversien (Bartonien, Éocène moyen) de Baron, Sablière Heudebert (Oise). 1a-b. Holotype MNHN.F.A89219 (coll. Pacaud), h = 38,1 mm. – 2a-b. MNHN.F.A89221 (coll. Pacaud), h = 37,7 mm. – 4. Motifs résiduels de couleur observés sous UV MNHN.F.A89220 (coll. Pacaud), h = 31,8 mm. – 3 et 5. *Athleta (Volutospina) depauperatus* (Sowerby J. de C., 1823), de l'Auversien (Bartonien, Éocène moyen) de Baron, Sablière Heudebert (Oise). – 3a-b. MNHN.F.A89319 (coll. Pacaud), h = 41,4 mm. – 5. Motifs résiduels de couleur observés sous UV MNHN.F.A89325 (coll. Pacaud), h = 38,8 mm.

Planche 2.



1-3. *Athleta (Volutospina) monstrosus* (Sowerby J., 1816). 1. Spécimen du Bartonien de Barton-on-Sea (Angleterre), MNHN.F.J17629 (coll. Cossmann), h = 41,6 mm. – 2. Spécimen du Marinésien (Bartonien, Éocène moyen) du Quoniam, Haravilliers (Val d'Oise), MNHN.F.A89318 (coll. Pacaud), h = 32,2 mm. – 3. Spécimen du Marinésien (Bartonien, Éocène moyen) du Quoniam, Haravilliers (Val d'Oise), MNHN.F.A46044 (coll. Pacaud), h = 29,1 mm. – 4. Reconstitutions de l'aspect natif de *Athleta (Volutospina) baili* nov. sp., MNHN.F.A89220 (coll. Pacaud), h = 31,8 mm. – 5. *Athleta (Neoathleta) spinicosta* Glibert, 1938 du Wemmelién (Bartonien, Éocène moyen) de Neder-Over-Heembeek (Belgique), holotype IRSNB 00342, h = 28,0 mm. – 6. Reconstitutions de l'aspect natif de *Athleta (Volutospina) depauperatus* (Sowerby J. de C., 1823), MNHN.F.A89325 (coll. Pacaud), h = 38,8 mm.

WESTERN PACIFIC CERITHIOPSIDAE  
PART. 1: SOLOMON AND MARQUESAS ISLANDS

Alberto Cecalupo  
Research Associate c/o Acquario Civico e Stazione Idrobiologica di Milano,  
Viale Gadio 2, 20121 Milano, Italy.  
Address: Via Grancino, 6 20090 Buccinasco (MI) Italy  
E-mail: [acecalupo@gmail.com](mailto:acecalupo@gmail.com)

Ivan Perugia  
Via Roncalceci 152, 48125 Ravenna, loc. Filetto, Italy  
E-mail: [ivanperugia@virgilio.it](mailto:ivanperugia@virgilio.it)

## Résumé

Dans cette contribution, quelques espèces de la famille des Cerithiopsidae signalées lors des expéditions opérées par le MNHN dans la zone ouest de l'océan Pacifique sont répertoriées. Des îles Salomon: 5 espèces ont été signalées par Cecalupo & Perugia (2021), 6 autres espèces sont maintenant signalées pour la première fois; l'un d'eux, *Belonimorphis cereum*, est une nouvelle espèce. De plus, des îles Marqueses: 9 espèces ont été signalées par Cecalupo & Perugia, (2014; 2021), et 5 autres sont maintenant signalées pour la première fois, l'une de ces espèces, *Marshallopsis lucida* apparaît comme une nouvelle espèce.

## Abstract

Here are listed the species of the Cerithiopsidae family reported during MNHN expeditions in the Western Pacific Ocean area. From Solomon Is.: 5 spp were reported by Cecalupo & Perugia (2021), 6 are now reported for the first time and one of these, *Belonimorphis cereum*, is a new species. From the Marquesas Islands: 9 were reported by Cecalupo & Perugia, (2014; 2021), 6 are now reported for the first time and from these, *Marshallopsis lucida* is a new species.

## Key words

Triphoroidea, Cerithiopsidae, Salomon Is., Marquesas Is.

## Introduction

The currently known species of Cerithiopsidae reported during MNHN expeditions carried out in the Western Pacific Ocean area are listed in the present paper.

From Salomon Is.: in Cecalupo & Perugia, 2021 the analysis of the material reported by Expedition SALOMON 1 (2001), [doi.org/10.17600/1100090](https://doi.org/10.17600/1100090), Expedition SALOMON 2 (2004) [doi.org/10.17600/4100090](https://doi.org/10.17600/4100090) and Expedition MADEEP (2014) [doi.org/10.17600/14004000](https://doi.org/10.17600/14004000) allowed the identification of 5 species; additional material from stn DW2237 (Exp. SALOMON 2) consisting of a total of 41 specimens, of which 23 in poor condition therefore unidentifiable, which allows us to add 6 species to the list of which 1, *Belonimorphis cereum*, is a new species.

From the Marquesas Is.: in Cecalupo & Perugia, 2014 from the analysis of the material reported by Expedition TARASOC (1997) and in Cecalupo & Perugia, 2021, of the material from

Expedition MUSORSTOM (1997), allowed the identification of 9 species. From the material reported by Campagne PAKAHI TE MOANA, 2012, another 71 specimens were reported, of which 62 were in poor condition and therefore unidentifiable, allowing us to add 6 species to the list of which 1, *Marshallopsis lucida*, is a new species.

## Methods

All the species described have been previously washed with ultrasound and then illustrated with digital colour and environmental scanning electron microscopy (ESEM) photos. Their identification is based only on the analysis of the shell's morphological characteristics. The soft parts are unknown. The size of the shells was measured manually with a microscope 20/40x.

## Abbreviations used in the text

**ESEM** Environmental scanning Electron Microscope.

**MNHN** Muséum National d'Histoire Naturelle, Paris, France

## SALOMON IS.

### Distribution of the listed species

The new species is highlighted in **bold**.

\* Species reported for Solomon Is. not illustrated.

**Abbreviations:** AU- Australia; C- Comoro; FP- French Polynesia; IND- Indonesia; J- Japan; LR- La Reunion; LY- Loyalty Is.; MS-

| Salomon Is.                         | AU | C | FP | IND | J | LR | LY | MS | MZ | NC | NZ | PH | PNG | RS | SL | SA | SM | V |
|-------------------------------------|----|---|----|-----|---|----|----|----|----|----|----|----|-----|----|----|----|----|---|
| <i>Belonimorphis cereum</i>         |    |   |    |     |   |    |    |    |    |    |    |    |     |    | X  |    |    |   |
| <i>Clathropsis buxace</i>           |    |   |    |     |   |    |    |    | X  |    |    |    |     |    | X  |    | X  |   |
| <i>Horologica gregaria</i>          |    |   | X  | X   | X |    |    |    |    |    | X  | X  | X   | X  | X  | X  | X  |   |
| <i>Horologica martini</i>           |    | X | X  | X   | X | X  | X  | X  |    | X  | X  | X  | X   | X  | X  |    | X  | X |
| <i>Horologica nodosa</i>            |    |   | X  | X   |   |    | X  | X  | X  |    | X  | X  | X   | X  | X  |    | X  |   |
| <i>Juculator bicinctus</i>          |    |   |    |     |   |    | X  | X  |    | X  | X  | X  | X   | X  | X  |    | X  |   |
| <i>Marshallopsis blanda</i>         |    | X | X  |     |   |    |    |    |    | X  | X  | X  | X   | X  | X  |    | X  |   |
| <i>Marshallopsis bouchei</i>        |    |   |    |     |   |    |    |    |    | X  | X  | X  | X   | X  | X  |    | X  |   |
| * <i>Marshallopsis sessoi</i>       |    |   |    |     |   |    |    |    |    |    | X  | X  | X   | X  | X  |    | X  |   |
| * <i>Mondax samadice</i>            |    |   |    |     |   |    |    |    |    |    |    | X  | X   | X  | X  |    | X  |   |
| * <i>Mondax sp.</i>                 |    |   |    |     |   |    |    |    |    |    |    | X  | X   | X  | X  |    | X  |   |
| * <i>Retilaskaya philippinensis</i> |    |   | X  |     | X | X  | X  | X  | X  |    | X  | X  | X   | X  | X  | X  | X  | X |

Mauritius; MZ- Mozambique; NC- New Caledonia; NZ- New Zealand; PH- Philippines; PNG- Papua New Guinea; RS- Red Sea; SL- Solomon; SA- South Africa; SM- South Madagascar; V- Vanuatu.

**Systematics**

Clade **Hipsogastropoda** Ponder & Lindberg, 1997  
 Informal Group **Ptenoglossa** Gray, 1853  
 Superfamily **Triphoroidea** Gray, 1847  
 Family **Cerithiopsidae** H. Adams & A. Adams, 1853

***Belonimorphis cereum*** n. sp.  
 (Pl. 1, figs. A-C)

**Type specimen:** holotype (MNHN-IM-2000-38627), dim. 4.95 x 1.95 mm, protoconch 0.50 x 0.17 mm, stn DW2237, South Taylor Reef.

**Type locality:** Solomon Is., South Taylor Reef, 400 m.

**Distribution:** only known from type locality.

**Material examined:** spm 1, stn DW2237, South Taylor Reef, N.O. "Alis", 400 m, 06°53'S-156°22'E, 30oct2004.

**Description of holotype:**

Shell medium in size, narrowly conical with flat sides and moderately engraved sutures, color whitish. Protoconch cylindrical, blunt-tipped of 3 smooth convex whorls; under ESEM embryonic whorl smooth, following whorls with 2 central well defined keel. Teleoconch of 12 whorls with reticulate sculpture of 2 prominent spiral cords crossed by axial ribs, about 15 on last whorl with evident beads at each intersection. A fourth cord at the base of last whorl emerging from insertion of outer lip; limit between columella and base highlighted by an angle and a very thin thread. Columella short, acuminate, obliquely truncated, columellar callus bordering a circular aperture, outer lip indented by the sculpture of the protoconch. Unknown soft parts.

**Comparison:**

5 species are currently reported in the genus *Belonimorphis* but only *Belonimorphis jayi* Cecalupo & Perugia, 2019 from Comoro Is., can be compared with *Belonimorphis cereum* n. sp. having a narrowly conical shape but differing mainly from the sculpture of the teleoconch which shows 3 spiral cords.

**Etymology:** from latin *cereus*, a, um in english wax-colored.

***Clathropsis bugeae*** Cecalupo & Perugia, 2014  
 (Pl. 1, fig. E)

*Clathropsis bugeae* Cecalupo & Perugia, 2014<sup>2</sup>: 88 figs. 1D, 6A, B; Cecalupo & Perugia, 2021: 30, figs. 11, E.

**Figured specimen:** dim. 4.60 x 1.12 mm, protoconch damaged, stn DW2237, South Taylor Reef.

**Type locality:** South Madagascar, Antisabe Cape, 22-24 m.

**Distribution:** Indopacific range.

**Distribution:** Mozambique, South Madagascar, Solomon Is.

**Material examined:** spms 2, stn DW2237, South Taylor Reef, N.O. "Alis", 400 m, 06°53'S-156°22'E, 30oct2004.

**notes:** first report for Solomon Is.

***Horologica martini*** Jay & Drivas, 2002 (Pl. 1, fig. H)

*Horologica martini* Jay & Drivas, 2002: 26, pl. 6, F, colour pl. 2, fig. 44.

not *Horologica* cf. *martini* in Severn, 2011: 240, pl. 103, fig. 4, 5 (likely a species to be named).

not *Horologica jayi* in Chen et al., 2012 (= *Horologica martini*).

not *Horologica jayi* in Cecalupo & Perugia, 2012: 35, 40, pl. 1 figs. A-C; pl. 42 figs. A-D; Chen, Tseng & Lo, 2012: 183, figs. 3-4; Cecalupo & Perugia, 2013: 85, pl. 19 figs. D-F, pl. 96 figs. A-D; Cecalupo & Perugia, 2014<sup>1</sup>: 18; Cecalupo & Perugia, 2014<sup>2</sup>: 100, figs. 1T, 8I, I-J; Cecalupo & Perugia, 2016: 101, fig. 1, E, fig. 3, A; Cecalupo & Perugia, 2016<sup>1</sup>: 38, pl. 15, figs. 3 a-f, pl. 16, figs. 1a-g; Cecalupo & Perugia, 2017: 38, pl. 15, figs. 3 a-f, pl. 16, figs. 1 a-g; Salvat & Tröndlé, 2017: 241; Cecalupo & Perugia, 2018: 32: pl. 12, figs. 2 a-g; 33, pl. 12, figs. 3 a-e; Cecalupo & Perugia, 2019<sup>2</sup>: 17, fig. 3, P; Blatterer, 2019: 237; Cecalupo & Perugia, 2019<sup>3</sup>: 21; Boutet et al., 2020: 229; Cecalupo & Perugia, 2021: 13, 51 (= *Horologica martini*).

**Figured specimen:** dim. 3.13 x 0.10 mm, protoconch 0.55 x 0.30 mm, stn DW2237, South Taylor Reef.

**Type locality:** La Réunion, Mauritius, Saint Gilles les Bains, off Boucan Canot beach.

**Material examined:** spm 1, stn DW2237, South Taylor Reef, N.O. "Alis", 400 m, 06°53'S-156°22'E, 30oct2004.

**notes:** first report for Solomon Is.

***Horologica nodosa*** Cecalupo & Perugia, 2012  
 (Pl. 1, fig. I)

*Horologica nodosa* Cecalupo & Perugia, 2012: 42, fig. 4 C; pl. 3 figs. C-D; pl. 49 figs. A-B; Cecalupo & Perugia, 2013: 86; Cecalupo & Perugia, 2014<sup>1</sup>: 18; Cecalupo & Perugia, 2016: 104, fig. 3, B; Cecalupo & Perugia, 2016<sup>1</sup>: 40, pl. 17, figs. 2 a-j; Cecalupo & Perugia, 2018: 37, pl. 14, figs. 4 a-c; Cecalupo & Perugia, 2019<sup>2</sup>: 17, fig. 3, T; Cecalupo & Perugia, 2021: 30.

*Horologica nodosa* Cecalupo & Perugia, 2012 in Salvat & Tröndlé, 2017: 241; Boutet et al., 2020: 230 [illustrated].

**Figured specimen:** holotype MNHN (n° Moll 23831), dim. 2.05 x 0.82 mm, protoconch 0.57 x 0.31 mm, Bohol Is., Manga.

**Type locality:** Philippines, Bohol Is., Manga, 4-10 m.

**Distribution:** Indopacific range.

**Material examined:** spm 1, stn DW2237, South Taylor Reef, N.O. "Alis", 400 m, 06°53'S-156°22'E, 30oct2004.

**notes:** first report for Solomon Is.; in plate is illustrated the holotype.

***Joculator bicinctus*** Cecalupo & Perugia, 2012  
 (Pl. 1, D)

*Joculator bicinctus* Cecalupo & Perugia, 2012: 45, fig. 3 B; pl. 5 figs. A-C; pl. 53 figs. A-C; Cecalupo & Perugia, 2013: 88, pl. 22 figs. E-F; pl. 100 figs. D-H; Cecalupo & Perugia, 2016: 48, pl. 21, figs. 3 a-c; Cecalupo & Perugia, 2018: 47, pl. 21, figs. 2 a-c.

**Figured specimen:** dim. 1.25 x 0.65 mm, protoconch damaged, stn DW2237, South Taylor Reef.

**Type locality:** Philippines, Panglao Is., Arco Point, 7-9 m.

**Distribution:** Indopacific range.

**Material examined:** spm 1, stn DW2237, South Taylor Reef, N.O. "Alis", 400 m, 06°53'S-156°22'E, 30oct2004.

**notes:** first report for Solomon Is.

**Marshallopsis blanda** Cecalupo & Perugia, 2012 (Pl. 1, fig. F)

Marshallopsis blanda Cecalupo & Perugia, 2012: 112, pl. 34 fig. A; pl. 128 figs. A-B; Cecalupo & Perugia, 2013: 89, pl. 24, figs. H-I, pl. 104 figs. F-I; Cecalupo & Perugia, 2014<sup>1</sup>: 20; Cecalupo & Perugia, 2018: 82, pl. 47, figs. 1 a-c.; Cecalupo & Perugia, 2021: 22, fig. 7, G-I.

Marshallopsis blanda Cecalupo & Perugia, 2012 in Salvat & Tröndlé, 2017: 242; Boutet et al., 2020: 232 [illustrated]; Sabelli, 2022: 96, 336; Blatterer, 2019: 239, pl. 116, fig. 25 a-b.

**Figured specimen:** dim. 2.17 x 0.65 mm, protoconch 0.50 x 0.27 mm, stn DW2237, South Taylor Reef.

**Type locality:** Philippines, Balicasag Is., 21 m.

**Distribution:** Indopacific range.

**Material examined:** spms 2, stn DW2237, South Taylor Reef, N.O. "Alis", 400 m, 06°53'S-156°22'E, 30oct2004.

**notes:** first report for Solomon Is.

**Marshallopsis boucheti** Cecalupo & Perugia, 2012 (Pl. 1, fig. G)

Marshallopsis boucheti Cecalupo & Perugia, 2012: 111, fig. 6 F, pl. 33 figs. F-G; pl. 126 figs. D-G; Cecalupo & Perugia, 2013: 89, pl. 25, figs. A-C, pl. 105 figs. A-E; Cecalupo & Perugia, 2014<sup>1</sup>: 20; Cecalupo & Perugia, 2016: 65, pl. 32, figs. 3 a-e; Cecalupo & Perugia, 2018: 82, pl. 47, figs. 2 a-c; Cecalupo & Perugia, 2021: 52, 58 figs. G-I.

Marshallopsis boucheti Cecalupo & Perugia, 2012 in Salvat & Tröndlé, 2017: 242; Boutet et al., 2020: 232 [illustrated]; Sabelli, 2022: 96, 336; Blatterer, 2019: 239, pl. 116, fig. 26 a-b [illustrated].

**Type locality:** Philippines, Panglao Is., Bingag/Talabong, up to 80 m.

**Distribution:** Indopacific range.

**Material examined:** spm 1, stn DW2237, South Taylor Reef, N.O. "Alis", 400 m, 06°53'S-156°22'E, 30oct2004.

**notes:** first report for Solomon Is.; in plate is illustrated the holotype.

## MARQUESAS IS.

### Distribution of the listed species

The new species is highlighted in **bold**.

\* Species reported for Marquesas Is. not illustrated.

**Abbreviations:** **AU**- Australia; **C**- Comoro; **FPM**- French Polynesia (Marquesas Is.); **IND**- Indonesia; **J**- Japan; **LR**- La Reunion; **LY**- Loyalty Is.; **MS**- Mauritius; **MZ**- Mozambique; **NC**- New Caledonia; **NZ**- New Zealand; **PH**- Philippines; **PNG**- Papua New Guinea; **RS**- Red Sea; **SL**- Solomon; **SA**- South Africa; **SM**- South Madagascar; **V**- Vanuatu.

### Systematics

Clade **Hipsogastropoda** Ponder & Lindberg, 1997

Informal Group **Ptenoglossa** Gray, 1853

Superfamily **Triphoroidea** Gray, 1847

Family **Cerithiopsidae** H. Adams & A. Adams, 1853

**Clathropsis chatenayi** Cecalupo & Perugia, 2017 (Pl. 2, figs. A-C)

Clathropsis chatenayi Cecalupo & Perugia, 2016: 22, pl. 3, figs. 2 a-i; Cecalupo & Perugia, 2018: 15, figs. 2 a-c; Cecalupo & Perugia, 2019: 10, pl. 2, figs. 1a-c; Cecalupo & Perugia, 2019<sup>1</sup>: 23, pl. 2, figs. 2.

**Figured specimen:** dim. 2.13 x 0.86 mm, protoconch 0.52 x 0.30 mm, stn MQ16-M, Fatu Hiva, Baie des Vierges.

**Type locality:** Loyalty Is., Lifou, Santal Bay, Shelter Reef, 12-32 m.

**Distribution:** French Polynesia (Marquesas Is.), New Caledonia, Papua New Guinea, Philippines.

**Material examined:** spm. 1, stn MQ16-M, Fatu Hiva, Baie des Vierges, N.O. "Braveheart", 0-1 m, 10°27,84'S-138°39,97'W, 17-18jan2012.

**notes:** first report for Marquesas Is.

**Joculator saguili** Cecalupo & Perugia, 2013 (Pl. 2, figs. E-F)

Joculator saguili Cecalupo & Perugia, 2013: 63, pl. 8 fig. F-G, pl. 64, figs. C-D; Cecalupo & Perugia, 2016: 59, 60, pl. 29, figs. 1 a-c, figs. 2 a-i; Cecalupo & Perugia, 2018: 73, pl. 41, figs. 1 a-c; Cecalupo & Perugia, 2019<sup>2</sup>: 33, illustrated; Cecalupo & Perugia, 2021: 43, 52.

**Figured specimen:** dim. 2,70 x 0,80 mm, stn MQ27-GR, Hatu Iiti.

| Marquesas Is.              | AU | C | FP | IN | J | L | LY | MS | M | NC | NZ | P | PN | RS |
|----------------------------|----|---|----|----|---|---|----|----|---|----|----|---|----|----|
|                            |    |   | M  | D  | R | R |    |    | Z |    |    | H | G  |    |
| *Clathropsis multispirae   |    |   | x  | x  | x | x |    |    | x | x  |    | x | x  |    |
| Clathropsis chatenayi      |    |   | x  |    |   |   | x  |    |   |    |    |   |    |    |
| Joculator saguili          |    | x | x  |    | x |   |    |    |   | x  |    |   |    |    |
| *Marshallopsis bazzocchi   |    |   | x  |    |   |   |    |    |   |    |    |   |    |    |
| *Marshallopsis blanda      |    | x | x  |    |   |   |    |    |   |    |    | x | x  | x  |
| Marshallopsis flavescens   |    |   | x  |    |   |   |    |    |   |    |    |   |    |    |
| *Marshallopsis letourneuxi |    |   | x  |    |   |   |    |    |   |    |    |   |    |    |
| Marshallopsis lucida       |    |   | x  |    |   |   |    |    |   |    |    |   |    |    |
| Marshallopsis melanostoma  |    |   | x  |    |   |   |    |    |   |    |    |   |    |    |
| *Marshallopsis maesta      |    |   | x  |    |   |   |    |    |   | x  |    | x |    |    |
| *Ondulopsis intricata      |    |   | x  |    |   |   |    |    |   |    |    | x |    |    |
| *Prolixodens lutea         |    |   | x  | x  |   |   | x  |    |   |    |    | x | x  | x  |
| *Prolixodens proxima       |    |   | x  |    |   |   |    |    |   |    |    |   |    |    |
| *Synthopsis praecuta       |    |   | x  |    | x |   | x  |    | x | x  |    | x | x  |    |
| *Synthopsis uahucensis     |    |   | x  |    |   |   |    |    |   |    |    |   |    |    |

**Figured specimen:** holotype MNHN (n° Moll 24144), 2.17 x 0.71 mm, protoconch, 0.50 x 0.28 mm, Panglao Is., Bingag/Tabalong.

**Type locality:** Vanuatu, East Aoré Is., Aisari Bay, intertidal.

**Distribution:** Indopacific range.

**Material examined:** spm 1, stn MQ27-GR, Hatu Iti, grotte, N.O. "Braveheart", 5-22 m, 09°23,71'S-140°07,75'W, 25jan2012.

**notes:** first report for Marquesas Is.

***Marshallopsis flavescens*** Cecalupo & Perugia, 2013 - (Pl. 2, figs. G-H)

*Marshallopsis flavescens* Cecalupo & Perugia, 2013: 67, pl. 9 fig. H, pl. 69 figs. A-C; Cecalupo, 2014<sup>2</sup>: 113; Cecalupo & Perugia, 2021: 39.

**Figured specimen:** dim. 2.42 x 0.87 mm, stn MQ3-GR, Nuku Hiva, Matateteiko.

**Type locality:** Vanuatu, West Tatuba Is., 114 m.

**Distribution:** French Polynesia (Marquesas Is.), Vanuatu.

**Material examined:** spms 2, stn MQ3-GR, Nuku Hiva, Matateteiko, N.O. "Braveheart", 20-25 m, 08°55,97'S-140°13,57'W, 08jan2012.

**notes:** first report for Marquesas Is.

***Marshallopsis lucida*** n. sp. (Pl. 2, figs. L-N)

**Type specimen:** holotype (MNHN-IM-2000-38628), dim. 2.28 x 0.75 mm, protoconch 0.52 x 0.30 mm, stn MQ15-GR, Fatu Hiva, Grotte Matautu, 0-28 m.

**Type locality:** Marquesas Is., Fatu Hiva, Grotte Matautu, 0-28 m.

**Distribution:** only know from type locality.

**Material examined:** spm 1, stn MQ15-GR, Fatu Hiva, Grotte Matautu, N.O. "Braveheart", 0-28 m, 10°28,31'S-138°40,68'W, 17-18jan2012.

#### Description of holotype:

Shell small, conical with impressed sutures, color uniformly light yellow translucent. Protoconch conical of 4.5 convex whorls; seen under ESEM first 1.5 embryonic whorls show a granulous surface, next whorls show on about 70% of the lower part of the surface of the whorls a sculpture of thin axial prosocline riblets (about 20 on last whorl), regularly spaced; the upper smooth part shows a series of minute grain immediately below the suture. Teleoconch of 5.25 whorls with reticulate sculpture of 3 equal spiral cords, crossed by weaker axial ribs, about 18 on last whorl; beads at each intersection. A fourth beaded cord at the base of last whorl emerging from insertion of outer lip; limit between columella and base highlighted by a groove. Columella short and broad, obliquely truncated, columellar callus bordering an oval aperture; anal sulcus and siphonal canal well defined.

#### Comparison:

*Marshallopsis lucida* n. sp. is compared with *Marshallopsis*

*albicans* Cecalupo & Perugia, 2012 from Philippines which differs in the whitish color, in a protoconch of only 3.5 whorls of which the last one is partially immersed in the first whorl of the teleoconch; also *Marshallopsis limpida* Cecalupo & Perugia, 2012 from Philippines is quite similar in shape and light color but mainly differs in having a different sculpture of the teleoconch initially of only 2 spiral cords.

**Etymology:** from latin *lucidus*, a, um in english traslucent.

***Marshallopsis melanesiana*** Cecalupo & Perugia, 2013 (Pl. 2, fig. D)

*Marshallopsis melanesiana* Cecalupo & Perugia, 2013: 69 pl. 10 fig. D, pl. 71 figs. A-C; Cecalupo & Perugia, 2014<sup>1</sup>: 20. Cecalupo & Perugia, 2021: 5, 6; 56, 64.

*Marshallopsis melanesiana* in Salvat & Tröndlé, 2017: 242; Boutet et al., 2020: 232 [illustrated].

**Figured specimen:** dim. 2.60 x 1.05 mm, stn MQ19-B, Northeast Hiva Oa, Horse grotte.

**Type locality:** Vanuatu, West Tatuba Is., 8-20 m.

**Distribution:** French Polynesia (Austral Is.), Vanuatu.

**Material examined:** spms 4, stn MQ19-B, Northeast Hiva Oa, Horse grotte, N.O. "Braveheart", 10-25 m, 09°45,67'S-138°50,69'W, 21jan2012.

**notes:** first report for Marquesas Is.

***Prolixodens proxima*** Cecalupo & Perugia, 2014 (Pl. 2, figs. I-K)

*Prolixodens proxima* Cecalupo & Perugia, 2014<sup>1</sup>: 11, figs. 14, 49-50.

*Prolixodens proxima* Cecalupo & Perugia, 2014 in Salvat & Tröndlé, 2017: 242; Boutet et al., 2020: 233 [illustrated].

**Figured specimen:** dim. 5,60 x 1.33 mm, stn MQ11-GR, Tahuata, grotte du Mtuoio.

**Type locality:** Marquesas Is., Hiva Oa, 340-352m.

**Distribution:** French Polynesia (Marquesas Is.).

**Material examined:** spm 1, stn MQ3-GR, Nuku Hiva, Matateteiko, N.O. "Braveheart", 20-25 m, 08°55,97'S-140°13,57'W, 08jan2012; spm 1, stn MQ11-GR, Tahuata, grotte du Mtuoio, N.O. "Braveheart", 6-12 m, 10°00,84'S-139°07,35'W, 15jan2012.

**notes:** as already highlighted in Cecalupo & Perugia, 2014: p. 12 the assignment to the genus *Prolixodens* is to be considered provisional being the teleoconch much more similar to the genus *Clathropsis*.

#### Station list Salomon Is.: Expedition MADEEP 2004.

stn DW2237, South Taylor Reef, N.O. "Alis", 400 m, 06°53'S-156°22'E, 30oct2004.

**Station list Marquesas Is.: Expedition PAKAIHI I TE MOANA 2012.**

## MQ1-GR

Nuku Hiva, Ekamako, N.O. "Braveheart", 8-10 m, 8°56,21'S-140°05,45'W, 7, 28JAN2012

## MQ2-GR

Nuku Hiva, les 4 grottes, N.O. "Braveheart", 20-23 m, 8°56,23'S-140°07,24'W, 7, 11-13, 29JAN2012

## MQ3-GR

Nuku Hiva, Matateteiko, N.O. "Braveheart", 20-25 m, 8°55,97'S-140°13,57'W, 8JAN2012

## MQ11-GR

Tahuata, grotte du Motuoio, N.O. "Braveheart", 6-12 m, 10°00,84'S-139°07,35'W, 15JAN2012

## MQ13-GR

Tahuata, grotte sans fond, Plongée grotte, N.O. "Braveheart", 27-35 m, 9°59,98'S-139°07,83'W, 15-16JAN2012

## MQ15-GR

Fatu Hiva, Grotte Matautu, N.O. "Braveheart", 0-28 m, 10°28,31'S-138°40,68'W, 17-18JAN2012

## MQ16-M

Fatu Hiva, baie des Vierges, N.O. "Braveheart", intertidal, 0-1 m, 10°27,84'S-138°39,97'W, 17-18JAN2012

## MQ19-B

NE Hiva Oa, Hors grotte, N.O. "Braveheart", 10-25 m, 9°45,67'S-138°50,69'W, 21JAN2012

## MQ27-GR

Hatu Iti, Grotte, N.O. "Braveheart", 5-22 m, 9°23,71'S-140°07,59'W, 25JAN2012

**BIBLIOGRAPHY**

BLATTERER H., 2019. Mollusca of the Dahab region (Gulf of Aqaba, Red Sea). *Denisia*, 43: 1-480.

BOUTET M., R. GOURGUET & J. LETOUNEUX, 2020. *Mollusque Marins de Polynésie française*. Editions Au vent des îles, Tahiti, pp. 1-766.

CECALUPO A., & PERUGIA I., 2012. Family Cerithiopsidae H. Adams & A. Adams, 1853 in the Central Philippines (Caenogastropoda: Triphoroidea). *Quaderni della Civica Stazione Idrobiologica di Milano* 30 [2011]: 5-262.

CECALUPO A., & PERUGIA I., 2013. *The Cerithiopsidae (Caenogastropoda: Triphoroidea) of Espiritu Santo, Vanuatu (South Pacific Ocean)*. Published by the authors: Milano. 253 pp.

CECALUPO A., & I. PERUGIA, 2014<sup>1</sup>. Cerithiopsidae and Newtoniellidae (Gastropoda: Triphoroidea Gray) from French Polynesia area (South Pacific Ocean). *Novapex*, 15(1): 1-22.

CECALUPO A., & I. PERUGIA, 2014<sup>2</sup>. The Cerithiopsidae

(Caenogastropoda: Triphoroidea) of South Madagascar (Indian Ocean). *Bollettino Malacologico* 50(2): 75-126.

CECALUPO A., & I. PERUGIA, 2016. Report on some Cerithiopsidae from Indo-Pacific Area (Caenogastropoda: Triphoroidea). *Bollettino Malacologico*, 52(2): 98-109.

CECALUPO A., & I. PERUGIA, 2017. Cerithiopsidae and Newtoniellidae (Gastropoda: Triphoroidea, Gray) from New Caledonia. Western Pacific. Supplement 7, *Choncology, Inc. VISAYA*, pp. 175.

CECALUPO A., & I. PERUGIA, 2017. A new species of Cerithiopsidae (Gastropoda: Triphoroidea) from the East China Sea. *Bollettino Malacologico*, 53: 30-32.

CECALUPO A., & I. PERUGIA, 2018. New species of Cerithiopsidae (Gastropoda: Triphoroidea) from Papua New Guinea (Pacific Ocean). Supplement 11, *Choncology, Inc. VISAYA*, pp. 187.

CECALUPO A., & I. PERUGIA, 2019<sup>1</sup>. Report from Bangka Pulau (Indonesia): Cerithiopsidae. *Bollettino Malacologico*, 55: 11-22.

CECALUPO A., & I. PERUGIA, 2019<sup>3</sup>. New species of Cerithiopsidae from Philippines and Samoa Is. (Caenogastropoda: Triphoroidea). *VISAYA*, 5(2): 19-34.

CECALUPO A., & I. PERUGIA, 2019<sup>2</sup>. New species of Cerithiopsidae and Newtoniellidae from Okinawa (Japan - Pacific Ocean). Supplement 12, *Choncology, Inc. VISAYA*, pp. 84.

CECALUPO A., & I. PERUGIA, 2021. Report on some Cerithiopsidae (Mollusca: Gastropoda) from the Indo-Pacific province. *Bollettino Malacologico*, 57(1): 1-71.

CHEN W.-J. [WEN-JOU], TSENG C.-F. [CHUEH-FEN] & L.-C. Lo [LIU-CHIH]. (2012). The marine mollusca from SiaoLiouciou, Taiwan. Pingtung County Government, Taiwan, R.O.C. 248 pp.

JAY M. & J. DRIVAS, 2002. The Cerithiopsidae (Gastropoda) of Reunion Island (Indian Ocean). *Novapex*, 3(1): 1-45, pl. 1-9, color plate 1-2.

SALVAT B. & J. TRÖNDLÉ, 2017. Biogéographie des Mollusques Marins de Polynésie Française. *Revue d'Ecologie (Terre et Vie)*, 72 (3), 2017 : 215-257.

SABELLI B., 2022. A semicritical list of shelled Gastropods cited from the Red Sea. *Bollettino Malacologico*, Supplemento 13, 58: 1-356.

SEVERNS M. 2011. *Shells of the Hawaiian Islands - The Sea Shells*. Conchbooks, Hackenheim. 564 pp.

# Plate 1



*Belonimorphus cereum* n. sp.  
Holotype 4.95 x 1.95 mm  
Salomon Is., South Taylor Reef



*Joculator bicinctum*  
Cecalupo & Perugia, 2012  
1.25 x 0.65 mm  
Salomon Is., South Taylor Reef



*Horologica martini*  
Jay & Drivas, 2002  
3.13 x 0.10 mm  
Salomon Is., South Taylor Reef



*Clathropsis bugeae*  
Cecalupo & Perugia, 2014  
4.60 x 1.12 mm  
Salomon Is., South Taylor Reef



*Marshallopsis blanda*  
Cecalupo & Perugia, 2012  
2.17 x 0.65 mm  
Salomon Is.,  
South Taylor Reef

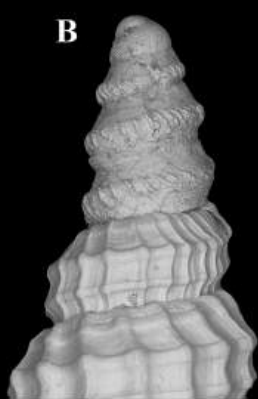


*Marshallopsis boucheti*  
Cecalupo & Perugia, 2012  
2.17 x 0.71 mm  
Holotype, Panglao Is., Philippines

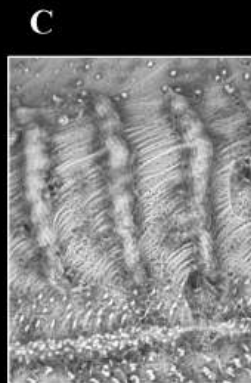


*Horologica nodosa*  
Cecalupo & Perugia, 2012  
2.05 x 0.82 mm  
Holotype, Bohol Is., Manila, Philippines

## Plate 2



*Clathropsis chatenayi*  
Cecalupo & Perugia, 2017  
2.13 x 0.86 mm  
Fatu Hiva, Baie des Vierges,  
Marquesas Is.



Detail of the sculpture



*Marshallopsis melanesiana*  
Cecalupo & Perugia, 2013  
2.60 x 1.05 mm  
N E Hiva Oa, Marquesas Is.



*Joculator saguili*  
Cecalupo & Perugia, 2013  
2.70 x 0.80 mm  
Hatu Iti, Marquesas Is.



*Marshallopsis flavescens*  
Cecalupo & Perugia, 2013  
2.42 x 0.87 mm  
Nuku Hiva, Matateteiko,  
Marquesas Is.



*Prolixodens proxima*  
Cecalupo & Perugia, 2014  
5.60 x 1.33 mm  
Nuku Hiva, Matateteiko,  
Marquesas Is.

*Prolixodens proxima*  
Holotype  
protoconch 0.62 x 0.27 mm,  
Hiva Oa, Marquesas Is.



*Prolixodens lucida* n. sp.  
Holotype 2.28 x 0.75 mm  
Fatu Hiva, Marquesas Is.



## DESCRIPTION OF A NEW *JASPIDICONUS* (CONOIDEA: CONIDAE) FROM BAHIA, BRAZIL.

### *JASPIDICONUS ELENAE* SP. NOV.

Gregorio Pereira de Queiroz,  
Alameda Casabranca 1204, apt 04,  
01408-000 São Paulo, SP, Brazil,  
GMAIL: GREGORIOPEREIRADEQUEIROZ@GMAIL.COM

Olivier Crabos,  
Rua Juiz Orlando Heleno de Mello 119, casa 1,  
Condominio Mirante de Piatã, 41650-465 Salvador BA, Brazil,  
Email: oli170711@gmail.com

Laudelino Passos de Almeida,  
Rua Rio Trobogy 806,  
Loteamento Veredas Piatã, C19, Piatã,  
41650-295 Salvador BA, Brazil

Geraldo Semer Pomponet Oliveira,  
Rua Arquimedes Gonçalves 62/501,  
Jardim Baiano, 40050-300 Salvador BA, Brazil,  
Email: gshells@hotmail.com

#### ABSTRACT

The description of a new mollusc species from the Bahia sub-province, North-East Brazil Atlantic Ocean seashore at low tide, named *Jaspidiconus elenae* sp. nov. is done here. The species is compared to *Jaspidiconus laudelinoi* Crabos & Pomponet, 2021, *Jaspidiconus itapua* Petuch & Berschauer, 2018, *Jaspidiconus pomponeti* Petuch & Myers, 2014, *Jaspidiconus keppensi* Coltro, 2004, *Jaspidiconus schirrmeisteri*, Coltro, 2004 and *Jaspidiconus iansa* Petuch, 1979. The first two species are compared because they are found on beaches located nearby in Salvador, and the last three because of their similarity to the species described here, although collected more than 400 km away.

#### KEYWORDS

Brazilian Molluscan province, Bahia Subprovince, Conidae, *Jaspidiconus*.

#### Collection references

UFRJ: Museu Nacional do Rio de Janeiro, Brazil.  
USNM: United states National Museum, Washington, USA  
GPQ: Gregorio Pereira de Queiroz, São Paulo, Brazil  
OC: Olivier Crabos, Salvador, Brazil  
FP Fabrice Prugnaud Suresnes France

#### Introduction:

Species of the genus *Jaspidiconus* have shown high diversification on the coast of the State of Bahia and specially on the beaches around the city of Salvador, capital of Bahia state. New species have been discovered in recent years, including in publications carried out by this group of researchers. Some, such as *Jaspidiconus laudelinoi* Crabos & Pomponet, 2021, *J. itapua* Petuch & Berschauer, 2018, *J. gregorioi* Crabos & Pomponet, 2021, *J. josei* Petuch & Berschauer, 2016, and *J. pomponeti* Petuch & Myers, 2014, were collected personally from tidal zone on the beaches around Salvador. The new species

of *Jaspidiconus* presented in this work was also collected by us, specifically on Barra beach in the city of Salvador. Apparently, the presence of different species of the genus *Jaspidiconus* in nearby locations is a characteristic fact of this genus. However, we believe that the family and genus deserve further revision, starting with the disagreement on the genus *Jaspidiconus* Petuch 2003 placed by other authors in the genus *Conasprella* Thiele 1929.

#### Material & Methods

The material was collected live by us only on the beaches that flank Farol da Barra, Salvador, Bahia. In addition to some dead specimens that were found in gravel bottom. Living specimens were always found buried at 50 cm to 1 meter depth in fine yellow sand, close to rocks, in natural pools during low tide. The method of sifting the sand was used to collect the specimens. Our study focused on shell shape and pattern. Although specimens were found alive, and based on that we made a brief description of the shape and pattern of their soft parts, these were not submitted to anatomy or DNA study.

#### Systematic descriptions

Infraorder Neogastropoda  
Superfamily Conoidea  
Family Conidae  
Genus *Jaspidiconus*  
Species *Jaspidiconus elenae* sp. nov.

#### *Jaspidiconus elenae* sp. nov.

#### Type Material

The holotype and the four paratypes came from our collections on the beaches around Farol da Barra, Salvador, BA.  
Holotype: adult specimen. Length: 11.0 mm ;Width: 6.1 mm; in UFRJ, MNRJ 24609..  
Paratype 1: adult specimen. Length: 10.4 mm ;Width: 5.4 mm;

in Museu Nacional do Rio de Janeiro in UFRJ, MNRJ 24610.

Paratype 2: adult specimen. Length: 12.3 mm; Width: 6.9 mm; Coll. OC.

Paratype 3: adult specimen. Length: 14.5 mm; Width: 8.0 mm; Coll. GPQ.

Paratype 4: adult specimen. Length: 15.1 mm; Width: 8.1 mm; Coll GPQ..

### Other material examined

A dozen of specimens were collected alive or just the shell on a gravel bottom. They present the same characteristics as the specimens used for the description and from the same location.

### Description

The shell is small even for the genus, whose species are relatively small. The adult specimens collected measure between 10mm and 15mm. The width varies between 5.5 and 8.1mm. The shell has 7.5 to 8 turns. The protoconch is white to pale beige and raised and has 1.5 whorls. The paucispiral protoconch that develops for a short time characterizes a short period of veliger, consequently, its distribution is geographically restricted and they are most likely endemic to the area. The last whorl of the spire has 14 to 18 white protruding nodules on its shoulder, with the apex of each nodule coinciding perfectly with the white dot. This feature quite well differentiates *Conus elenae* sp. nov. from other species from Salvador. The ratio between spire and shell body is 3:14 on average. The body shape is slightly domed, narrowing into a gentle curve towards the siphonal canal. The surface of the entire body has slightly granulate spiral lines. The body color varies between dark brown and light grey, with a predominance of dark brown. The patches of color are distributed independently of the spiral lines. However, many granules of the spiral lines are white, like the nodules at the edge of the spiral. The aperture occupies an average of 0.7 of the total body and is slightly wider as it approaches the siphonal canal. The inner part of the outer lip is brown and grey, and slightly lilac. The specimens found are quite homogenous in all these characteristics. The animal specimens collected alive have a milky white mantle. The presence of an operculum was not observed.

### Type Locality

Intertidal region on the beaches around Farol da Barra, Salvador BA.

### Remarks

The restricted distribution of the genus *Jaspidiconus* is due to its veliger having a very brief phase, denoted by the paucispiral protoconch. What makes the species of the genus to be found in very restricted areas? As an example of this, in the region around Salvador, BA, we have the endemism of *Jaspidiconus itapua* Petuch & Berschauer, 2018 to Praia de Itapuã, that of *J. pomponeti* Petuch & Myers, 2014 to Praia da Ribeira, *J. henckesi* Coltro, 2004 to Berlinque beach on Itaparica Island. Farol da Barra beach, located at the most prominent point of the city of Salvador, has stone reefs forming a natural protection for marine life and also for bathers. It is in this specific location

that we find the species described here, far from the locations of the other *Jaspidiconus* in the region and well delimited by its reefs.

### Distribution

So far, specimens of the species have only been found on the sandy and rocky beaches around Farol da Barra, Salvador, BA.

### Etymology

The name is a tribute to Elena Bondar, mother of researcher Gregório Pereira de Queiroz. Born in Salvador, she was a regular at Praia do Farol da Barra, in her childhood and youth. Afterwards, she took her son to the beach for his first swim. Elena was the daughter of the eminent entomologist and botanist Gregório Bondar, and received identical homage named in insects and plants described by her father.

### Discussion

*Jaspidiconus elenae* sp. nov. is compared with other species of the genus that exist in nearby locations, as well as with other species from distant regions, but whose shell is similar.

*Jaspidiconus elenae* sp. nov. is distinguished from *J. itapua* Petuch & Berschauer, 2018 because *J. itapua* is larger and has a smoother body; if there are light grooves, these are much more superficial. Its color is more orange or pink, and the inner part of the shell is quite orange. Its spire is more elongated. The white nodules that border the edge of the spire in *Jaspidiconus elenae* sp. nov. are completely absent in *J. itapua*.

*Jaspidiconus elenae* sp. nov. is distinguished from *J. laudelinoi* Crabos & Pomponet, 2021, as *laudelinoi* is yellow with white spots, its body is smooth and the spire is practically without nodules.

*Jaspidiconus elenae* sp. nov. differs from *J. pomponeti* Petuch & Myers, 2014 because the latter is entirely white, its spire is much higher and more pointed. Its body is decidedly more nodular. *J. pomponeti* has sometimes smaller nodules along the edge of the whorl, however they are fewer in number and much less salient.

*Jaspidiconus elenae* sp. nov. differs from *J. iansa* Petuch 1979 because the latter is much larger, adult specimens are reaching 20mm, lighter in general color and more nodular, although the nodules on the spire margin are not marked with white dots.

Of the Bahian *Jaspidiconus*, *Jaspidiconus elenae* sp. nov. is more similar to *J. schirrmeisteri* Coltro 2004 from Abrolhos region, South of Bahia, with small shell, brown colored and presenting nodules on its shoulder as well, but differentiated from *elenae* by its pink protoconch and by the number of its shoulder nodules, from 10 to 12 only.

Some similarities are observed with *J. keppensi* (Petuch & Berschauer, 2018), although it comes from Alcobaça, in the south of Bahia, located more than 800km from Salvador. *J. keppensi* has the less salient protoconch, the shoulder of the spire is much smoother, the body line is straighter and the

shell is bigger.

There is an elegantly accentuated curvature to the body of *Jaspidiconus elenæ* sp. nov., which makes it quite distinctive, as are the white nodules along the shoulder of the spire.

### Acknowledgements

We are thankful to Alexandre Pimenta from MNRJ who took the pictures and gave us his support.

### Bibliographic references

COLTRO JOSÉ 2004, New species of Conidae from Northeastern Brazil (Mollusca:Gastropoda), *Strombus* 11, Conquiliologistas do Brasil, São Paulo, Brazil

PETUCH EDWARD J. 2013, Biogeography and Biodiversity of Western Atlantic Mollusks, CRC Press, Boca Raton FL, New York NY, London UK

PETUCH AND MYERS 2014, New species of Conidae and Conilithidae (Gastropoda, Conoidea) from the Bahamas, East Caribbean and Brazil, *Xenophora Taxonomy* 3, AFC

PETUCH AND MYERS 2014, Addition to the Cone Shell Faunas (Conidae and Conilithidae) of the Cearaian and Bahian Subprovinces, Brazilian Molluscan Province, *Xenophora Taxonomy* 4, AFC, 2014

POREMSKI A. 2014, Disentangling the Hidden Biodiversity of the Genus *Jaspidiconus*, *The Festivus* Vol 45(4), San Diego Shell Club

PETUCH AND BERSCHAUER 2018, Ten New Cone Shells from Indonesia, the Marquesas Island, Brazil and Pacific Panama, *The Festivus* Vol 50 (1), San Diego Shell Club

MONNIER ERIC, LIMPALAËR LOÏC, ROBIN ALAIN & ROUX CHRISTOPHE 2018, A Taxonomic Iconography of Living Conidae, Volume 1, AFC, Paris, France & Conchbooks, Harxheim, Germany.

PETUCH EDWARD J. AND BERSCHAUER DAVID P. 2021, Tropical Marine Mollusks, An Illustrated Biogeographical Guide, CRC Press, Boca Raton FL, New York NY, London UK

Plate 1.



1. *Jaspidiconus elenae* sp. nov. Holotype,  
UFRJ ,MNRJ 24609, Farol da Barra, Salvador, BA,  
11.00 x 6,10 mm.

2. *Jaspidiconus elenae* sp. nov. Paratype 1,  
UFRJ ,MNRJ 24610, Farol da Barra, Salvador, BA,  
10.40 x 5,40 mm.

3. *Jaspidiconus elenae* sp. nov. Paratype 2,  
Coll. OC, Farol da Barra, Salvador, BA,  
12.30 x 6,90 mm.



4,5,6. *Jaspidiconus keppensi* (Petuch & Berschauer, 2018), Alcobaça J. keppensi (Petuch & Berschauer, 2018)  
20.5 x 10.5 mm, Coll. OC



7,8,9. *Jaspidiconus schirrmeisteri*, Coltro 2004, Abrolhos Archipelago State of Bahia, Brazil  
10.5 x 5.3 mm Coll. OC      9.04 x 5.14 mm Coll. FP # 556      10.47 x 5.87 mm Coll. FP # 557

Plate 2.



10,11,12. *Jaspidiconus itapua* Petuch & Berschauer, 2018 Itapua, Bahia State, Brazil.

15.29 x 8.62 mm Coll. FP # 2669

15.14 x 8.17 mm Coll. FP # 2661



13,14,15. *Jaspidiconus laudelinoi* Crabos & Pomponet, 2021, Itapuã beach, Salvador city, Bahia State, Brazil.

11.7 x 6.34 mm Coll. FP #4894

11.98 x 6.30 mm Coll. FP #4983

11.65 x 6.14 mm Coll. FP #4892



16,17,18. *Jaspidiconus pomponeti*, Petuch & Myers, 2014, Todos os Santos Bay, Salvador, Bahia State, Brazil

13.87 x 7.05 mm Coll. FP #3892

10.87 x 5.95 mm Coll. FP #575

9.52 x 4.99 mm Coll. FP #576



19,20,21. *J. iansa* Petuch 1979, Abrolhos Archipelago State of Bahia, Brazil

Holotype USNM 780661

Coll. Andre Poremski

14.07 x 7.24 mm Coll. FP #555

12 x 7 mm

---

# ENRICHING THE MARINE MOLLUSCS' BIODIVERSITY OF THE MEDITERRANEAN AND THE HELLENIC SEAS (BY APRIL 2023)

Thanasis Manousis  
PO Box 48 K, 57500 Epanomi, Greece  
Email: [athanasiosmanousis@gmail.com](mailto:athanasiosmanousis@gmail.com)

Giannis Zaminos  
Markantonaki 10, 73133 Chania, Greece  
Email: [tzouras09@gmail.com](mailto:tzouras09@gmail.com)

Constantinos Kontadakis  
Aegyptou 98A, 16562 Glyfada, Greece  
Email: [costaskontadakis@yahoo.com](mailto:costaskontadakis@yahoo.com)

George Mbazios  
Orfanidou 27, 11142 Athens, Greece  
Email: [gmpazios@gmail.com](mailto:gmpazios@gmail.com)

Sofia Galinou-Mitsoudi\*  
Corresponding author  
International Hellenic University (IHU)  
Department of Environmental Engineering  
PO Box 141, 57400 Thessaloniki, Greece  
Email: [galimits@gmail.com](mailto:galimits@gmail.com)

## Keywords

Biodiversity, Greece, Mediterranean Sea, Mollusca, New Records

## Abstract

The Hellenic marine malacofauna is affected by current environmental changes, ongoing research, and the introduction of alien species. Out of the 12 image documented species in this work: first records are *Onoba* cf. *erugata* for the Mediterranean Sea, *Pseudosetia ficaratiensis* for the Central and East Mediterranean Sea, *Vitreolina cionella* for the Eastern Mediterranean Sea, *Alvania campanii*, *A. rominae*, *Careliopsis modesta* and *Notodiaphana atlantica* for the Hellenic Seas; second documented records are *A. zaraensis*, *Tellimya semirubra*, *Lepetella barrajoni* and *Vitreolina antiflexa* for the Hellenic Seas; *A. cf. esmes* and *Onoba* cf. *erugata* are species of not established identity. Taxonomy is followed by discussion.

## Introduction

The Eastern Mediterranean Sea is a playground of non-indigenous species introductions (Por, 1990; Galil, 2009; Zenetos *et al.*, 2010, 2017; Zenetos & Galanidi, 2020). This so-called "Erythrean invasion" is nowadays registered from adjacent countries (e.g. Katsanevakis *et al.*, 2009; Manousis *et al.*, 2010; Çinar *et al.*, 2011; Manousis & Galinou-Mitsoudi, 2013; Ammar, 2018; Manousis *et al.*, 2018; Zenetos *et al.*, 2018; Bariche & Fricke, 2020; Crocetta *et al.*, 2020; Manousis *et al.*, 2020a, b, c; Mbazios *et al.*, 2020; Kontadakis *et al.*, 2021; Manousis *et al.*, 2021; Zaminos *et al.*, 2021; Manousis *et al.*, 2022a, b; Mbazios *et al.*, 2022; Kolokotronis *et al.*, 2023) and some have reached the Central Mediterranean, Tunisia (Ounifi-Ben Amor *et al.*, 2016), Italy (Occhipinti-Ambrogi *et al.*, 2011), and France (Daniel *et al.*, 2009; Bodilis *et al.*, 2011). Moreover, accelerating climate warming is especially affecting the Eastern Mediterranean Basin (Ozer *et al.*, 2017), causing the decline

of indigenous species and more favourable conditions for the establishment of tropical species (Rilov, 2016; Albano *et al.*, 2021). The Hellenic marine molluscan biodiversity has been reviewed two years ago in a systematic catalogue by Manousis (2021a) and further updated recently (Manousis, 2023). Attentive research efforts are proven helpful to increase ecological knowledge while perceptive human resources management in the form of citizen science monitoring projects have shown that the Hellenic Seas are in need of further search (Galinou-Mitsoudi *et al.*, 2023). Considering the above issues, the aim of this study is to further investigate the presence of autochthonous and allochthonous molluscan species in more localities of the Hellenic Seas.

## Methods

Sampling, handling and species recognition were conducted according to Manousis & Galinou-Mitsoudi (2013) and Mbazios *et al.* (2020) from January to April 2023 in locations throughout the Hellenic Seas. All 1st and 2nd documented records for the Mediterranean and the Hellenic Seas are listed below with collection data. Description of certain specimens is given whenever additional information aid to identification. Findings are presented in Figures 1-3. Specimens are deposited in the premises of C. Kontadakis, T. Manousis, G. Mbazios, and G. Zaminos. Scientists are welcome to access the biological material for inspection by appointment.

## Results

**Abbreviations:** **BB** - Biogenic Bottom Material; **CEMS1** = First record for Central and East Mediterranean Sea; **CGZ** - Collection Giannis Zaminos; **CTM** - Collection Thanasis Manousis; **EMS1** - First record for the East Mediterranean Sea; **G1, G2** - First or second record for Greece; **MB** - Mixed Bottom; **MS1** = First record for the Mediterranean Sea; **Ra** - Rare; **Un** - Uncommon

## The records

### Bivalvia

***Tellimya semirubra*** (Gaglioli, 1992) (Fig. 1a). The species was originally referred from Rhodes Island, Greece without image documentation by Zenetos & van Aartsen (1995). First image documentation for Greece by Manousis *et al.* (2020b) and is now collected again as a fresh shell from MB, 50 m, Glyfada, Saronic Gulf, 37°52'N - 23°41'E, G2, Ra (Repetto *et al.*, 2005). Seems to be distributed all over the Aegean Sea.

### Gastropoda

***Lepetella barrajoni*** Dantart & Luque, 1994 (Fig. 1b). First image documented for Greece by Manousis *et al.* (2022b) is now collected again as a fresh shell from MB, 50 m, Glyfada, Saronic Gulf, 37°52'N - 23°41'E, Ra, G2.

***Alvania campanii*** Tisselli & Giunchi, 2013 (Fig. 1c). MB, 10 m, Cape, Epanomi, Greece, (40°22'N - 22°52'E), 28/1/2023, small gear fishing nets, Un, G1.

**Description:** Shell small, is 1.83 mm high and 1.15 mm wide (h/w = 2) with about 3 teleoconch whorls. Protoconch globose, paucispiral of 1.25 whorls, 300 µm high. Embryonic shell 250 µm, larval shell about 350 µm maximum diameter. Microsculpture of some 14 granular and wavy spiral cords. Onset of the teleoconch with 2 well evident spirals cords. Teleoconch of slightly more than 3 whorls. The spiral cords intersect on the body round with about 12 axial ribs that stop immediately before the suture, forming a cancellated sculpture in which the intercostal spaces are about double the ribs. Incremental lines visible. There are 4 spiral cords over the suture, and 4 basal, all of slightly darker colour. Umbilicus absent. Aperture pear-shaped with outer lip furrowed internally by slender teeth and with a large whitish external varix. The shell is shiny, of light honey-brown colour and with a median white band. The columellar zone slightly darker brownish.

***Alvania* cf. *esmes*** Manousis, J. D. Oliver & Zaminos, 2023 (Fig. 1d).

#### Material examined:

***Alvania esmes*** Manousis, J. D. Oliver & Zaminos, 2023. 10 shells, CTM, Greece, MB, -120 m, Pyrgadikia, Chalkidiki, Siggitikos Gulf, North Aegean Sea, 40°14'N - 23°55'E; 1 shell, CTM, Greece, BB, -80 m, Skyros Island, Central Aegean Sea, 38°47'N - 24°28'E; 18 shells, CGZ, Greece, MB, -100 m, Ayios Onoufrios, Chania Gulf, Crete Island, 35°33'N - 24°03'E (Manousis *et al.*, 2023).

***Alvania* cf. *esmes*** Manousis, J. D. Oliver & Zaminos, 2023.

**Description:** Paucispiral and globose protoconch of about 1.3 whorls, with 5 spiral equidistant spiral cords, 250 µm high, and 335 µm maximum diameter. Teleoconch solid but thin, 3.5 slightly convex whorls, body whorl proportionally large, total height 2.2 mm. Profile ovate-conical, impressed suture. Spiral sculpture of 7 equidistant cords on the last turn, 4 of which on the base and 3 above the aperture. Two cords present at the onset of the teleoconch. Axial sculpture of numerous nearly orthocline not equidistant ribs, narrower than the interspaces and thin, 26 on the penultimate whorl, and 28 on ultimate. Axial ribs of variable strength and extension on the last whorl, reaching the base. Spiral sculpture prevails over the axial

one. Small blunt tubercles emerge at the junctions of ribs and cords. Square or rectangular gaps. Teleoconch with spiral very fine granular microsculpture. Aperture oval, angled at the top, rounded at the base. Outer lip with varix just before opening, with acute lip margin, weak teeth just visible on the inside. Umbilicus absent. Snow-white colour, translucent. MB, 3 m, Pantokratoras, Preveza, 38°94'N - 20°73'E.

***Alvania rominae*** Amati, Trono & Oliverio, 2020 (Fig. 2a).

**Material studied:** The present shell was collected from MB material, 100 m, Central Siggitikos Gulf, Greece, (30°12'N - 24°00'40E), 9/8/2019, G1.

**Description:** Shell solid, oval-conical, 3.25 mm high, 1.75 mm wide, h/w ratio 1.85. Protoconch paucispiral, globose, of 1.3 whorls, 305 µm high, nucleus diameter 130 µm, first half whorl diameter 220 µm, maximum diameter 365 µm, sculpture of a 13 slightly spiral and wavy threads. Teleoconch of 4.3 slightly convex whorls with deep suture. Axial sculpture of 9 orthocline ribs interrupted at the periphery on the last whorl, as wide as the interspaces, slightly prosocline on the body whorl. Spiral sculpture of 11 non-equidistant spiral cords on the last whorl, of which 5 above the aperture, one by the suture, and 5 on the base, with two cords starting immediately after the protoconch/teleoconch limit. Basal cords decreasing in size and strength, last one barely noticeable. Microsculpture of spiral minute threads and weak incremental lines. No umbilical fold. Aperture large, pyriform, height 1.2 mm, h/ha ratio 2.7. Outer lip sharp, with large prosocline varix, without internal teeth. Colour yellow-pink background, with darker spiral cords. Base, internal of aperture and varix lighter whitish. *A. rominae* was originally described by Amati *et al.* (2020)

***Alvania zaraensis*** Amati & Appolloni, 2019 (Fig. 2b). The species has been reported from Crete and Saronikos Gulf, Greece, without image documentation (Amati *et al.*, 2019). Referring to some of their specimens from Crete and Turkey, the latter authors discuss, "We consider this material worthy of a deeper insight for these potentially diagnostic characters (Amati *et al.*, 2019, page 106). It is now collected from a different location of Crete (Falasarna, 35°30'N - 23°34'E, February 2023) and image documented for the first time.

***Onoba* cf. *erugata*** Ponder & Worsfold, 1994 (Fig. 2c). One shell, MB, 10 m, Cape, Epanomi, Greece, (40°22'N - 22°52'E), 28/1/2023, small gear fishing nets, MS1.

**Description:** Shell rather featureless, hyaline white, brilliant and robust, ovate and turritiform, 1.40 mm high, 0.80 mm wide, h/w ratio 1.75. Protoconch homeostrophic, large but obtuse, embryonic shell some 180 µm wide, larval shell some 360 µm wide. Teleoconch of 3 convex whorls with shallow suture, body whorl some 70% of shell's length. Aperture large, oval, and some 37%, with sharp outer lip, oblique columella and inner lip extending over the columella. Sculpture of fine prosocline incremental lines and very fine spiral ones. Umbilical chink minute, no columellar plait. Surface glossy and smooth.

***Pseudosetia ficaratiensis*** (Brugnone, 1876) (Fig. 2d). One fresh shell, CTM, MB, -120 m, Pyrgadikia, Chalkidiki, Siggitikos Gulf, North Aegean Sea, Greece, 40°14'N - 23°55'E, 9/1/2023. G1 for the Hellenic waters and second record for the Central and East Mediterranean Sea (CEMS1). The species is referred from off southwestern Portugal and the Strait of Gibraltar and as

fossil from Sicily (Central Mediterranean Sea) and is depicted in Bouchet & Warén (1993, page 684) and Giannuzzi Savelli et al. (2002, page 87) as well as from the Alboran Sea (WoRMS, <https://www.marinespecies.org/aphia.php?p=taxdetails&id=141328#distributions>).

**Description:** Shell 1.65 mm high and 1.05 mm wide (h/w = 1.55), smooth and bright, translucent white, conical-ovate with blunt apex and large aperture. Protoconch dome-shaped, of 1.45 whorls sculptured with a few faint spiral lines, of some 440 µm maximum diameter. Protoconch-teleoconch limit indicated by yellow arrow in Fig. 2d. Teleoconch of 2.5 slightly convex whorls sculptured with irregularly appearing incremental lines and irregular fine spiral lines, body whorl angular at its periphery. Suture shallow but distinct. Aperture ovate. Parietal callus thin and retracted into the aperture. Outer lip thin and fragile, rather orthocline. Inner lip wide and concealing the umbilical crevice.

**Vitreolina cionella** (Monterosato, 1878) (Fig. 3a).

**Material studied:** One fresh shell, CTM, MB, -120 m, Pyrgadikia, Chalkidiki, Siggitikos Gulf, North Aegean Sea, Greece, 40°14'N - 23°55'E, 9-1-2023, EMS1 and G1 for the Hellenic waters. The species was known from Sicily (Gaglioli, 1992; Appolloni et al., 2018) and W Mediterranean Sea (Gofas et al., 2011), Ra (Repetto et al., 2005).

**Description:** Minute shell, hyaline, white with yellowish hue by the suture, 1.35 mm high, 0.5 mm wide, high spire with straight axis and oblique columella. Protoconch globose of some 1.5 whorls, teleoconch of some 3 slightly convex whorls with the last occupying some 60% of the total length, aperture drop-shaped occupying some 33% of the shell's length and with a protruding outer lip by its periphery. Surface smooth and brilliant, with fine and dense incremental marks.

**Vitreolina antiflexa** (Monterosato, 1884) (Fig. 3b). First image documented for Greece by Manousis (2012) is now collected again as a fresh and fully grown shell from MB, 4-6 m, Karras, Kimolos Island, 36°47'N - 24°34'E, Un, G2, September 2021.

**Careliopsis modesta** (de Folin, 1870) (Fig. 3c).

**Material studied:** Two shells, MB, 10 m, Cape, Epanomi, Greece, (40°22'N - 22°52'E), 28/1/2023, small gear fishing nets, G1.

**Description:** Shell white hyaline and fragile, sub cylindrical and turriform, 1.70 mm high, 0.55 mm wide, h/w ratio 3.1. Protoconch large, of type A, partially submerged, some 220 µm wide, with nucleus partially visible. Teleoconch of 4.5 convex whorls with deep suture. Distinct axial sculpture of orthocline attenuated ribs especially on the last part of the shell, some 17-18 on the body whorl, as wide as the interspaces. Spiral sculpture of numerous equidistant spiral furrows, some 25 on the whole surface of the last whorl. No umbilical rim. Aperture small, ovate.

**Notodiaphana atlantica** Ortea, Moro & Espinosa, 2013 (Fig. 3d). First image documentation for Greece of a known for the area species (Romani et al., 2021). 4 shells, G1, beached, Falasarna, Crete, 35°30'N - 23°34'E, February 2023.

## Discussion

This work includes collection results of the period from January to April 2023 and is part of the ongoing study of the marine malacofauna of the entire Hellenic territory. Out of the 12 image documented species in this work: first records are

*Onoba* cf. *erugata* for the Mediterranean Sea, *Pseudosetia ficaratiensis* for the Central and East Mediterranean Sea, *Vitreolina cionella* for the Eastern Mediterranean Sea, *Alvania campanii*, *A. rominae*, *Careliopsis modesta* and *Notodiaphana atlantica* for the Hellenic Seas; second documented records are *A. zaraensis*, *Tellimya semirubra*, *Lepetella barrajoni* and *Vitreolina antiflexa* for the Hellenic Seas; *A. cf. esmes* and *Onoba* cf. *erugata* are species of not established identity underlining the first occurrence of a species similar to the exotic *Onoba erugata* in the Mediterranean Sea. All referred species are image documented records.

*Lepetella barrajoni* was found in NE Atlantic - its type locality - (Dantart & Luque, 1994), in the Central Mediterranean Sea (Cossignani & Ardovini, 2011) and in the E Mediterranean (N Aegean Sea) (Manousis et al., 2022b). Now it is recorded from Saronikos Gulf (Central Aegean Sea) for the second time for Greece. Both areas where found in Greece are among of the higher maritime traffic lines in the Hellenic seas (Hammoud, 2020). *Lepetella barrajoni* could be an introduced species in the E Mediterranean Sea by ships due to its scattered and limited records from all over the Mediterranean Sea.

*Alvania campanii*. Our specimen exhibits morphological characters close to those of a paratype (Tisselli & Giunchi, 2013, fig. 17) and is also morphologically very similar, but the protoconch sculptural decoration, to sympatric specimens of *A. bozcaadensis* Tisselli & Giunchi, 2013 (Manousis, 2021a, page 120), a case bringing in mind the possibility of broader interspecific protoconch decoration pleomorphism within certain species of the genus *Alvania*.

*Alvania* cf. *esmes*. The shell described here is characterized by its relatively attenuated axial sculpture reminiscent of *Alvania* sp. (Romani et al., 2017, page 71 fig. 1), however, in the latter species four spiral cords run above the aperture, and the protoconch of our shell exhibits the spiral decoration of *A. esmes* (Manousis et al., 2023). This phenomenon of reduction of axial sculpture can also be encountered in *A. dictyophora* (R. A. Philippi, 1844) (in Romani et al., 2017, page 72, fig. 2G), or *A. cingulata* (Philippi, 1836) or even some forms of *A. hallgassi* Amati & Oliverio, 1985, but the protoconch morphology of our specimen and its dense granular texture of its surface clearly differentiate it from them (Amati & Oliverio, 1985; Buzzurro & Prkić, 2007; Garilli, 2008; Romani, 2015). *A. cf. esmes* could be an ecophenotype of *A. esmes* linked to shallow and calm waters, not in sympatry with specimens well defined as typical *A. esmes*. We cannot completely exclude the possibility of dealing with a separate species that has not yet been described, but given the absence of additional specimens and of living material it is not possible to go beyond the hypotheses set out. We should also consider an extensive quantitative and qualitative variability in the morphology of *Alvania* species, far beyond that we currently use to assign specimens to different *Alvania* species.

*Alvania rominae*. Our specimen exhibits all the characters of the species with minor observed differences attributed to developmental and the species variability. As the species was described only 3 years ago with specimens from S Italy (W Ionian Sea, Central Mediterranean), our specimens from N Aegean Sea (E Mediterranean Sea) expand its distribution. Nevertheless, more material is needed to complete the

taxonomical details of the species.

*Onoba* cf. *erugata*. Small shells similar to members of the Rissoidae Family have proven difficult to classify on shell characters only. In the last decades studies on radulae, opercula and anatomy have facilitated their classification (Ponder & Worsfold, 1994). Out of all members of the genus *Onoba* H. Adams & A. Adams, 1852 image documented in the literature, our specimen shares similarities with the South Atlantic species *Onoba erugata* (Ponder & Worsfold, 1994, page 29, Fig. 19A) regarding its ovate conic outlook, its translucency, the shape, number and size of the protoconch whorls, the lightly convex outline, the moderately convex whorls, the rounded periphery of the body whorl, the simple and impressed suture, the number of teleoconch whorls, its smooth and glossy surface with moderately strong growth lines, the oval and weakly angled posteriorly aperture with sharp peristome, the narrow inner lip that is attached to the parietal wall in its posterior part, its minute umbilical chink, its transparency and the white colour. It differs, though, in that our specimen is robust, bears prosocline incremental lines and its protoconch seems to lack the spiral decoration of *O. erugata*. Our shell's morphology shares also similarities with species of the genus *Rissoella* Gray, 1847; however, all currently known species of that genus differ in their contour, fragility, and the presence of an umbilicus. Due to the above reasons, the lack of anatomical and molecular data, and the fact that there is only one specimen available for study, we refrain from a definitive generic assignment (Ponder & Worsfold, 1994; Gofas *et al.*, 2011; Scaperrotta *et al.*, 2012; Giannuzzi-Savelli *et al.*, 2014). Moreover, we cannot exclude the possibility of dealing with a cryptogenic species that has never been encountered before or is rather recently introduced into the Mediterranean Basin either via Suez Canal or the Strait of Gibraltar perhaps by means of shipping transportations.

*Pseudosetia ficaratiensis* is a rare species known from the Strait of Gibraltar and the Atlantic Ocean (Repetto *et al.*, 2005) that shares some shell features with *Pseudosetia amydralo* Bouchet & Warén, 1993 - a species of S America - from which it differs in the lack of a regular spiral sculpture, its flatter whorls and more regularly ovate shape, and its angular by the periphery body whorl (Bouchet & Warén, 1993). The here recorded fresh shell from the N Aegean Sea may constitute one more case of shipping transported organisms.

*Careliopsis modesta*. A rare (Repetto *et al.*, 2005) or uncommon for the Mediterranean Sea (Giannuzzi-Savelli *et al.*, 2014) species that is now G1.

*Notodiaphana atlantica* has been rather recently described by Ortea *et al.* (2013); its Mediterranean distribution has been discussed by Micali (2014) and reviewed by Romani *et al.* (2021).

All introduced species, independently of the introduction path and their robustness, need significant parameters in order to survive and settle in their new areas, such as favorable environmental conditions and lack of pollution and predators. The case that all needed appropriate parameters coincide is rare and many alien individuals disappear or remain alive for short periods. Perhaps, this is the reason that first findings are shells or fresh dead specimens. We mention the occurrence of *Rapana venosa* (Valenciennes, 1846) in the N Aegean Sea,

Thermaikos Gulf (Koutsoubas & Voultsiadou, 1991) of higher salinity in relation to the Black Sea, and the absence of any published reference thereafter.

## Acknowledgements

The authors are grateful to the anonymous referees for their useful contribution to improve the publication.

## References

- ALBANO P. G., STEGER J., BAKKER P. D. J., BOGI C., BOŠNJAK M., GUYHAIM T., FUSEYINOGLU M. F., LAFOLLETTE P. I., LUBINEVSKY H., MULAS M., STOCKINGER M., AZZARONE M., SABELLI B., 2021. Numerous new records of tropical non-indigenous species in the Eastern Mediterranean highlight the challenges of their recognition and identification. *ZooKeys*, 1010: 1–95. <https://doi.org/10.3897/zookeys.1010.58759>
- AMATI B., OLIVERIO M., 1985. *Alvania* (*Alvaniella*) *hallgassi* sp. n. *Notiziario C.I.S.Ma.*, 6: 28-34.
- AMATI B., APPOLLONI M., QUAGGIOTTO E., SMRIGLIO C., OLIVERIO M., 2019. Notes on some taxa of the *Alvania lineata*-complex with the descriptions of three new species from the Mediterranean Sea (Gastropoda: Rissoidae). *Iberus*, 37 (1): 81-112.
- AMATI B., TRONO D., OLIVERIO M., 2020. Description of *Alvania rominae* n. sp. from the Mediterranean Sea (Mollusca Gastropoda Rissoidae) *Biodivers. J.*, 11 (2): 541–551.
- AMMAR I., 2018. New record of alien species of gastropods in Syrian coast. *Damascus University Journal of Basic Science*, 34: 95-122.
- APPOLLONI M., SMRIGLIO C., AMATI B., LUGLIÈ L., NOFRONI I., TRINGALI L. P., OLIVERIO M., 2018. Catalogue of the primary types of marine molluscan taxa described by Tommaso Allery Di Maria, Marquis of Monterosato, deposited in the Museo Civico di Zoologia, Roma. *Zootaxa*, 4477 (1): 1. doi:10.11646/zootaxa.4477.1.1
- BARICHE M., FRICKE R., 2020. The marine ichthyofauna of Lebanon: an annotated checklist, history, biogeography, and conservation status. *Zootaxa*, 4775: 1-157. <https://doi.org/10.11646/zootaxa.4775.1.1>
- BODILIS P., ARCEO H., FRANCOUR P., 2011. Further evidence of the establishment of *Fistularia commersonii* (Osteichthyes: Fistulariidae) in the north-western Mediterranean Sea. *Mar. Biodivers. Rec.*, 4: E18. <https://doi.org/10.1017/S1755267211000194>
- BOUCHET P., WARÉN A., 1993. Revision of the Northeast Atlantic bathyal and abyssal Mesogastropoda. *Boll. Malacol.*, supplement 3: 579-840.
- BUZZURRO G., PRKIĆ J., 2007. A new species of *Alvania* (Gastropoda: Prosobranchia: Rissoidae) from Croatian coast of Dalmatia. *Triton*, 15: 5-9.
- ÇINAR M. E., BILECENOGLU M., ÖZTÜRK B., KATAGAN T., YOKES M. B., *et al.*, 2011. An updated review of alien species on the coasts of Turkey. *Mediterr. Mar. Sci.*, 12: 257-315. <https://doi.org/10.12681/mms.34>
- COSSIGNANI T., ARDOVINI R., 2011. *Malacologia Mediterranea, Atlante delle conchiglie del Mediterraneo*. L' Informatore Piceno, Ancona, Italy.
- CROCETTA F., BITAR G., ZIBROWIUS H., OLIVERIO M., 2020. Increase in knowledge of the marine gastropod fauna of

- Lebanon since the 19th century. *Bull. Mar. Sci.*, 96: 22. <https://doi.org/info:doi/10.5343/bms.2019.0012>
- DANIEL B., PIRO S., CHARBONNEL E., FRANCOUR P., LETOURNEUR Y., 2009. Lessepsian rabbit fish *Siganus luridus* reached the French Mediterranean coasts. *Cybium* 33: 163-164.
- DANTART L., LUQUE A. A., 1994. Cocculiniformia and Lepetidae (Gastropoda: Archaeogastropoda) from Iberian waters. *J. Molluscan Stud.*, 60 (3): 277-313.
- GAGLINI A., 1992. *Eulima cionella* Monterosato, 1878. *Boll. Malacol.*, 28 (5-12): 203-206.
- GALIL B. S., 2009. Taking stock: inventory of alien species in the Mediterranean Sea. *Biol. Invasions*, 11: 359-372. <https://doi.org/10.1007/s10530-008-9253-y>
- GALINOUMITSOUDI S., ZAMINOS G., MANOUSIS T., KONTADAKIS C., STASINOS S., MBAZIOS G., PORFYRIS A., 2023. Mediterranean and Hellenic Seas: new records and distributional status of marine mollusca (by December 2022). *Xenophora Taxonomy*, 39: in press.
- GARILLI V., 2008. On some Neogene to Recent species related to *Galeodina* Monterosato, 1884, *Galeodinopsis* Sacco, 1895, and *Massotia* Bucquoy, Dautzenberg, and Dollfus, 1884 (Caenogastropoda: Rissoidae) with the description of two new *Alvania* species from the Mediterranean Pleistocene. *The Nautilus*, 122 (1): 19-51.
- GIANNUZZI-SAVELLI R., PUSATERI F., PALMERI A., EBREO, C., 2002. *Atlante delle conchiglie marine del Mediterraneo*, Vol. 2. Roma: Edizioni "Evolver".
- GIANNUZZI-SAVELLI R., PUSATERI F., MICALI P., NOFRONI I., BARTOLINI S., 2014. *Atlante delle conchiglie marine del Mediterraneo*, Vol. 5. Palermo: Edizioni Danaus.
- GOFAS S., MORENO D., SALAS C., 2011. *Moluscos Marinos de Andalucía*, Vol. 1. Málaga: Universidad de Málaga.
- HAMMOUD M. A. E. R., LAKKIS I., KNIO O., HOTEIT, I., 2020. Moving source identification in an uncertain marine flow: Mediterranean Sea application. *Ocean Eng.*, 108435. doi:10.1016/j.oceaneng.2020.108435
- <https://www.marinespecies.org/aphia.php?p=taxdetails&id=141328#distributions>
- KATSANEVAKIS S., TSAMIS K., IOANNOU G., MICHAILIDIS N., ZENETOS A., 2009. Inventory of alien marine species of Cyprus. *Mediterr. Mar. Sci.*, 10: 109-134. <https://doi.org/10.12681/mms.113>
- KOLOKOTRONIS D., MANOUSIS T., PAPAVALSILEIOU K., KONTADAKIS C., GALINOUMITSOUDI S., 2023. New records and distributional status of marine Mollusca of Cyprus (by September 2022). *Xenophora Taxonomy*, 38: 25-32.
- KONTADAKIS C., MBAZIOS G., MANOUSIS T., GALINOUMITSOUDI S., 2021. Records of the Indo-Pacific species *Heliacis implexus* (Mighels, 1845) (Gastropoda, Architectonicidae) established in the Mediterranean Sea. *Xenophora Taxonomy*, 32: 18-22.
- KOUTSOUBAS D., VOULTSIADOU-KOUKOURA E., 1991. Occurrence of *Rapana venosa* (Valenciennes, 1846) in the Aegean Sea. *Boll. Malacol.*, 26 (10-12): 201-204.
- MANOUSIS T., 2012. *The Sea Shells of Greece*. Thessaloniki: Kyriakidis Brothers.
- MANOUSIS T., 2021a. *Hellenic Conches*. Harxheim: Conchbooks, 609 pp. ISBN 978-3-948603-17-5
- MANOUSIS T., 2023. The Marine Mollusca of Greece: an up-to-date, systematic catalogue, documented with bibliographic and pictorial references. *Xenophora Taxonomy*, 40: in press.
- MANOUSIS T., MPARDAKIS G., PARASKEVOPOULOS C., GALINOUMITSOUDI S., 2010. The Bivalvia Mollusca of Thessaloniki and Thermaikos Gulfs (North Aegean Sea), Greece with emphasis on new species for Hellenic waters. *J. Biol. Res.-Thessalon.*, 14: 161-179.
- MANOUSIS T., GALINOUMITSOUDI S., 2013. New gastropod records for the Eastern Mediterranean Sea and one new alien (*Emarginula decorata* Deshayes, 1863) for the Mediterranean Sea from NW Aegean Sea, Greece. *J. Biol. Res. Thessalon.*, 21: 1-20.
- MANOUSIS T., KONTADAKIS C., POLYZOULIS G., MBAZIOS G., GALINOUMITSOUDI S., 2018. New marine gastropod records for the Hellenic waters. *J. Biol. Res. Thessalon.*, 25: 6.
- MANOUSIS T., KONTADAKIS C., MBAZIOS G., GALINOUMITSOUDI S., 2020a. New records of Cimidae, Murchisonellidae and Pyramidellidae (Mollusca: Gastropoda: Heterobranchia) for the Mediterranean Sea and the Hellenic Waters. *Xenophora Taxonomy*, 28: 3-27.
- MANOUSIS T., PORFYRIS A., MBAZIOS G., ZAMINOS G., KONTADAKIS C., GALINOUMITSOUDI S., 2020b. New bivalve occurrences for the Mediterranean and the Hellenic Seas. *Xenophora Taxonomy*, 29: 1-15.
- MANOUSIS T., KONTADAKIS C., ZAMINOS G., ZEIMBEKIS C., MBAZIOS G., GALINOUMITSOUDI S., 2020c. New records of Lower Heterobranchia (Mollusca: Gastropoda) for the Mediterranean and the Hellenic Seas. *Xenophora Taxonomy*, 30: 22-39.
- MANOUSIS T., ZAMINOS G., KONTADAKIS C., MBAZIOS G., PORFYRIS A., GALINOUMITSOUDI S., 2021. New records of Mollusca for the Mediterranean and the Hellenic Seas. *Xenophora Taxonomy*, 31: 30-44.
- MANOUSIS T., TISSELI M., GALINOUMITSOUDI S., 2022a. Description of *Odostomia widmeri* spec. nov. (Mollusca, Gastropoda, Pyramidellidae) from the Eastern Mediterranean Sea. *Xenophora Taxonomy*, 36: 69-72.
- MANOUSIS T., MBAZIOS G., ZAMINOS G., PORFYRIS A., PAPAVALSILEIOU K., KONTADAKIS C., GALINOUMITSOUDI S., 2022b. Mediterranean and Hellenic Seas: New records and distributional status of marine molluscs (by September 2022). *Xenophora Taxonomy*, 39: 11-21.
- MANOUSIS T., BALDOVI J. D. O., ZAMINOS G., 2023. Description of *Alvania esmes* spec. nov. (Mollusca, Gastropoda, Rissoidae) from the Eastern Mediterranean Sea. *Xenophora Taxonomy*, 38: 3-9.
- MBAZIOS G., KONTADAKIS C., GALINOUMITSOUDI S., MANOUSIS T., 2020. New gastropod records for the Mediterranean and the Hellenic Seas. *Xenophora Taxonomy*, 27: 34-58.

- MBAZIOS G., ROZAKIS T., ZAMINOS G., KARYPIDIS S., MINOS G., PAPAVALSILEIOU K., KONTADAKIS C., MANOUSIS T., GALINO-MITSOU S., 2022. New records and distributional status of marine Mollusca for the Hellenic Seas (by September 2021). *Xenophora Taxonomy*, 35: 8-16.
- MICALI P., 2014. On the presence of *Notodiaphana atlantica* Ortea, Moro, Espinosa, 2013 in the Mediterranean Sea, with notes on *Retusa multiquadrata* Oberling, 1970 and *Cylichna mongii* (Audouin, 1826) (Cephalaspidea Cylichnidae). *Biodivers. J.*, 5(4): 499-504.
- OCCHIPINTI-AMBROGI A., MARCHIMI A., CANTONE G., CASTELLI A., CHIMENZ C., et al., 2011. Alien species along the Italian coasts: an overview. *Biol. Invasions*, 13: 215-237. <https://doi.org/10.1007/s10530-010-9803-y>
- ORTEA J., MORO L., ESPINOSA J., 2013. Nueva especie de *Notodiaphana* Thiele, 1931 del Océano Atlántico y nueva ubicación genérica para *Atys alayoi* Espinosa & Ortea, 2004 (Gastropoda: Opisthobranchia: Cephalaspidea). *Revista de la Academia Canaria de Ciencias*. 25: 15-24.
- OUNIFI-BEN AMOR K., RIFI M., GHANEM R., DRAEIF I., ZAOUALI J., BEN SOUSSI J., 2016. Update of alien fauna and new records from Tunisian marine waters. *Mediterr. Mar. Sci.*, 17: 124. <https://doi.org/10.12681/mms.1371>
- OZER T., GERTMAN I., KRESS N., SILVERMAN J., HERUT B., 2017. Interannual thermohaline (1979-2014) and nutrient (2002-2014) dynamics in the Levantine surface and intermediate water masses, SE Mediterranean Sea. *Glob. Planet. Change*, 151: 60-67. <https://doi.org/10.1016/j.gloplacha.2016.04.001>
- PONDER W. F., WORSFOLD T. M., 1994. A review of Rissoiform Gastropods of Southwestern South America (Mollusca, Gastropoda). *Contributions in Science* (Natural History Museum of Los Angeles County), 445: 1-63. DOI: 10.5962/p.208081
- POR F. D., 1990. Lessepsian migration. An appraisal and new data. *Bulletin de l'Institut Oceanographique Monaco*, 7: 1-10.
- REPETTO G., ORLANDO F., ARDUINO G., 2005. *Conchiglie del Mediterraneo*. Alba: Amici del Museo "Federico Eusebio".
- RILOV G., 2016. Multi-species collapses at the warm edge of a warming sea. *Sci. Rep.*, 6: 36897. <https://doi.org/10.1038/srep36897>
- ROMANI L., 2015. *Alvania dalmatica* Buzzurro et Prkic, 2007 (Gastropoda Rissoidae): range extension, shell variability, habitat and relationships with *A. hallgassi* Amati & Oliverio, 1985. *Biodivers. J.*, 5 (4): 509-514.
- ROMANI L., SIRAGUSA F., BOGI C., 2017. Su di una peculiare forma di *Alvania* Risso, 1826 del Mar Mediterraneo (Mollusca: Gastropoda: Rissoidae). *Alleryana* 35 (2): 69-73.
- ROMANI L., TRIGALI L. P., CROCETTA F., 2021. A review of occurrence, distribution and alien status of *Notodiaphana atlantica* Ortea, Moro and Espinosa, 2013 and *Liloea mongii* (Audouin, 1826) (Mollusca: Heterobranchia) in the Mediterranean Sea. *Oceanol. Hydrobiol. Stud.*, 50, (3): 259-268.
- SCAPERROTTA M., BARTOLINI S., BOGI C., 2012. *Accrescimenti. Stadi di accrescimento dei molluschi marini del Mediterraneo*. Volume IV. L'Informatore Piceno, 184 pp.
- TISELLI M., GIUNCHI L., 2013. Due nuove specie di *Alvania* (Gastropoda: Rissoidae) dal nord-ovest della Turchia. *Quad. Studi Nat. Romagna*, 37: 163-174.
- ZAMINOS G., APOSTOLOU C., PORFYRIS A., MANOUSIS T., ZEIMBEKIS C., TSIRAS S., GALINO-MITSOU S., 2021. New records of extant and fossil Mollusca for the Hellenic Seas. *Xenophora Taxonomy*, 34: 16-25.
- ZENETOS A., AARTSEN VAN J. J., 1995. The deep sea molluscan fauna of the S.E. Aegean Sea and its relation to the neighboring faunas. *Boll. Malacol.*, 30 (10-12): 253-268.
- ZENETOS A., GOFAS S., VERLAQUE M., ÇINAR M. E., RASO J. E. G., et al., 2010. Alien species in the Mediterranean Sea by 2010. A contribution to the application of European Union's Marine Strategy Framework Directive (MSFD). Part I. Spatial distribution. *Mediterr. Mar. Sci.*, 11: 381. <https://doi.org/10.12681/mms.87>
- ZENETOS A., ÇINAR M. E., CROCETTA F., GOLANI D., ROSSO A., SERVELLO G., SHENKAR N., TURON X., VERLAQUE M., 2017. Uncertainties and validation of alien species catalogues: The Mediterranean as an example. *Estuar. Coast. Shelf Sci.*, 191: 171-187. <https://doi.org/10.1016/j.ecss.2017.03.031>
- ZENETOS A., CORSINI-FOKA M., CROCETTA F., GEROVASILEIOU V., SIMBURA N., et al., 2018. Deep cleaning of alien and cryptogenic species records in the Greek Seas (2018 update). *Manag. Biol. Invasions*, 9: 209-226. <https://doi.org/10.3391/mbi.2018.9.3.04>
- ZENETOS A., GALANIDI M., 2020. Mediterranean non indigenous species at the start of the 2020s: recent changes. *Mar. Biodivers. Rec.*, 13: 10. <https://doi.org/10.1186/s41200-020-00191-4>

Plate 1.

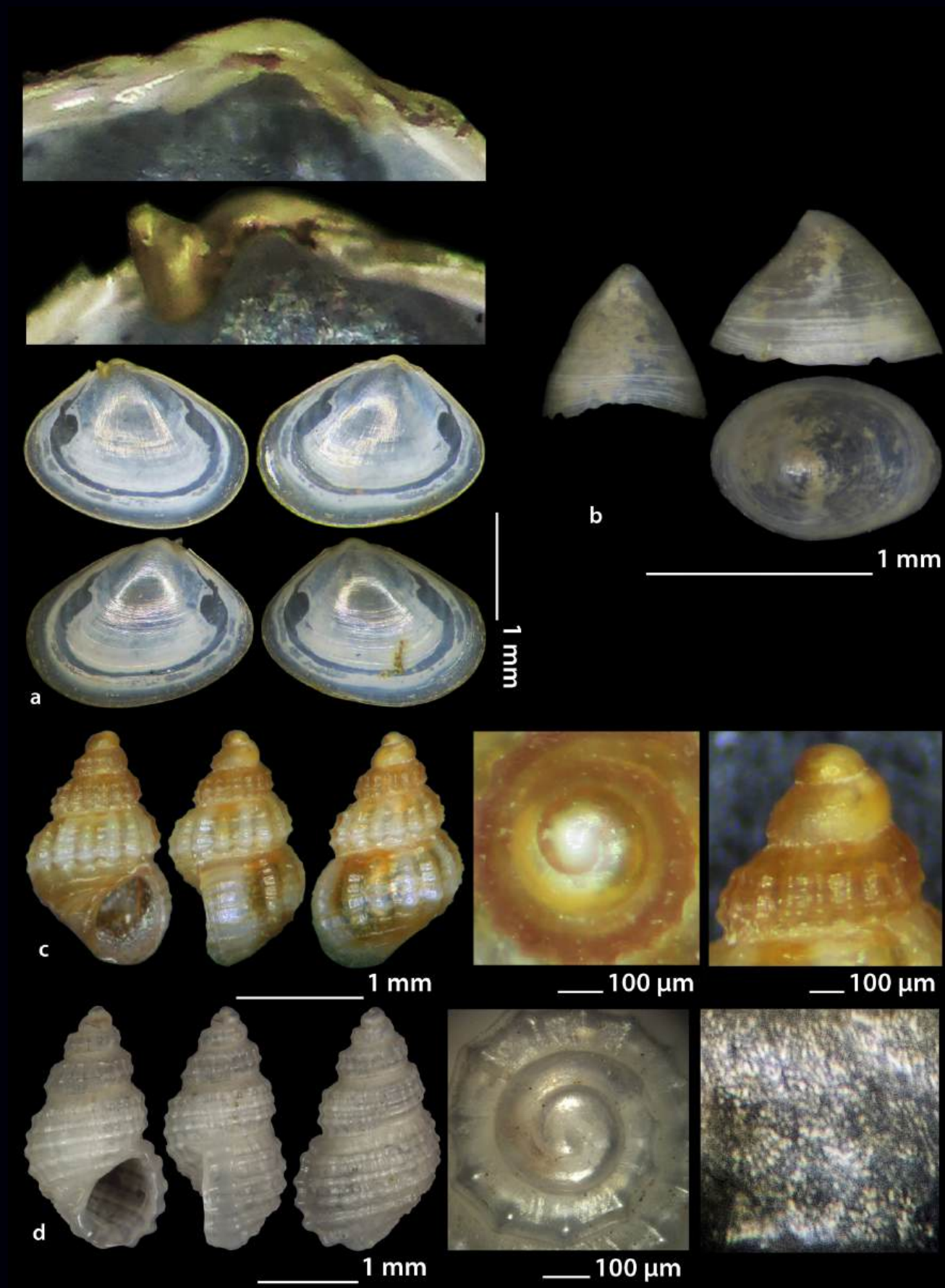


**Figure 1:** a. *Tellimya semirubra* (Gaglini, 1992); b. *Lepetella barrajoni* Dantart & Luque, 1994; c. *Alvania campanii* Tisselli & Giunchi, 2013; d. *Alvania* cf. *esmes* Manousis, J. D. Oliver & Zaminos, 2023.

Plate 2.

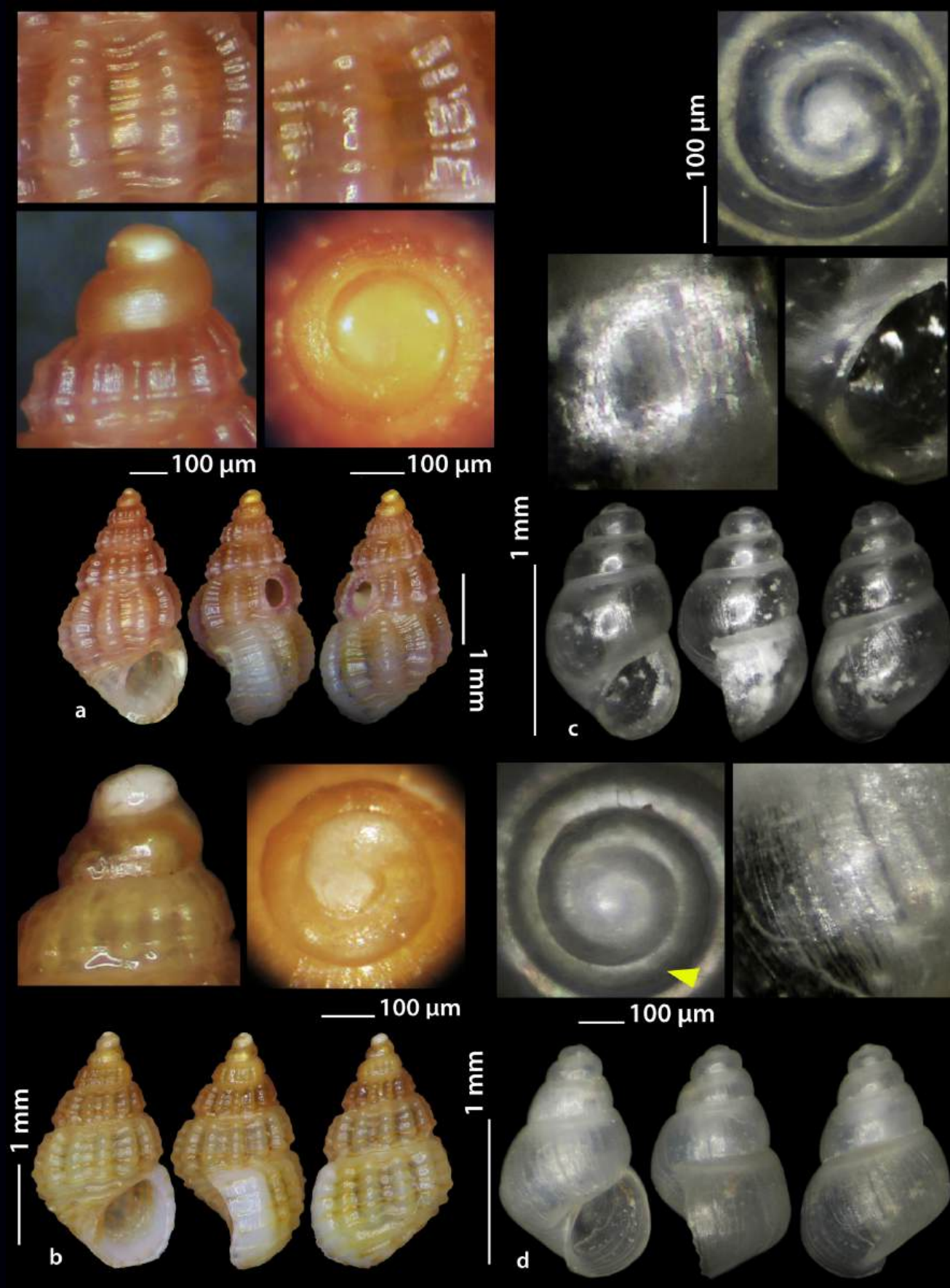


Figure 2: a. *Alvania rominae* Amati, Trono & Oliverio, 2020; b. *Alvania zaraensis* Amati & Appolloni, 2019; c. *Onoba* cf. *erugata* Ponder & Worsfold, 1994; d. *Pseudosetia ficaratiensis* (Brugnone, 1876).

Plate 3.

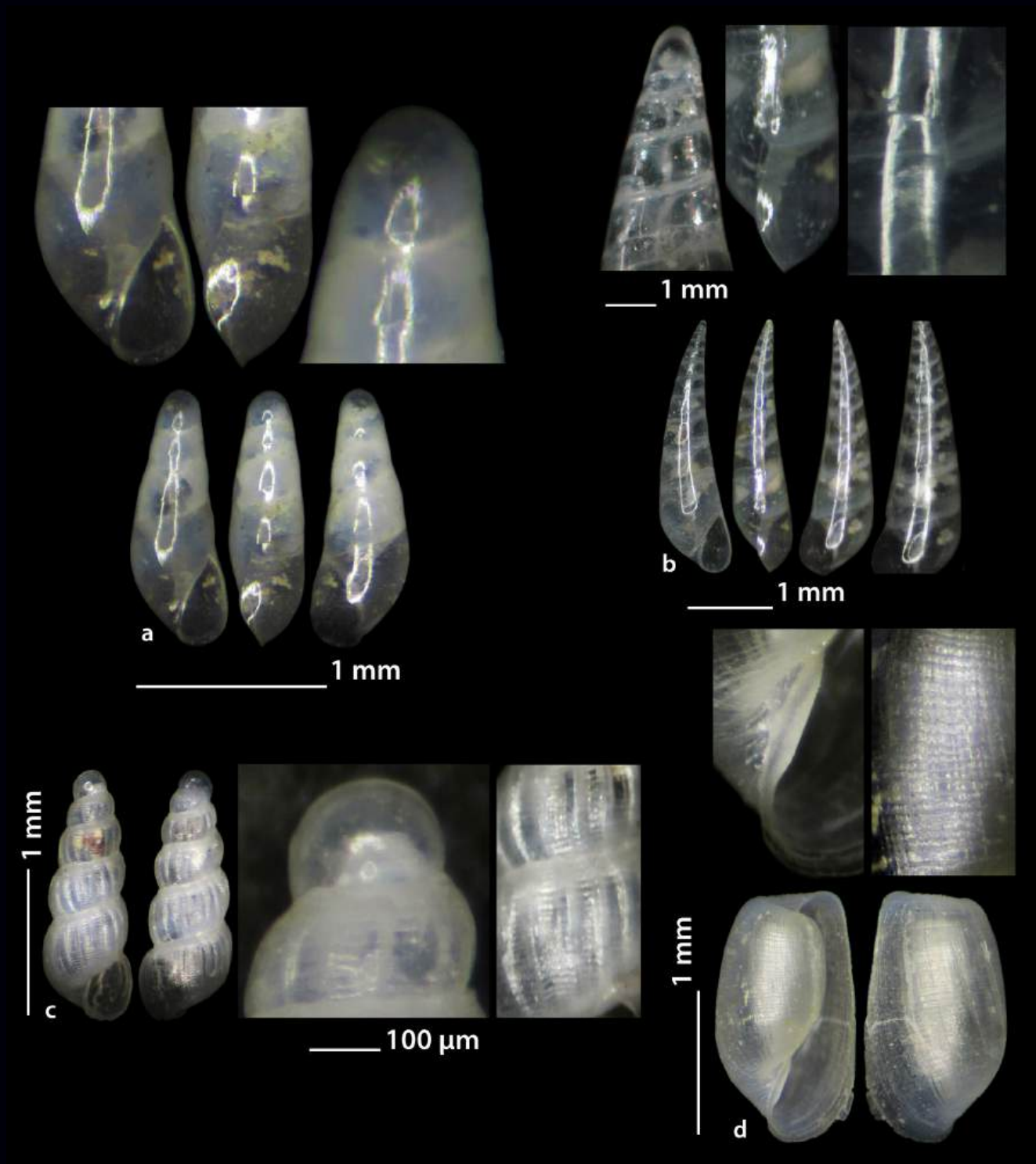


**Figure 3:** a. *Vitreolina cionella* (Monterosato, 1878); b. *Vitreolina antiflexa* (Monterosato, 1884); c. *Careliopsis modesta* (de Folin, 1870); d. *Notodiaphana atlantica* Ortea, Moro & Espinosa, 2013.

## DESCRIPTION OF TWO NEW SPECIES OF MARGINELLIDAE FROM NORTHEAST BRAZIL

Olivier Crabos

, Rua Juiz Orlando Heleno de Mello 119, casa 1,  
Cond Mirante de Piatã,  
41650-465 Salvador BA, Brazil.  
E-mail : [Oli170711@gmail.com](mailto:Oli170711@gmail.com)

Gregorio Pereira de Queiroz,

Alameda Casabranca 1204, apt 04,  
01408-000 São Paulo, Brazil.

E-mail : [gregoriopereiradequeiroz@gmail.com](mailto:gregoriopereiradequeiroz@gmail.com)

Geraldo Semer Pomponet Oliveira

Rua Arquimedes Gonçalves 62/501,  
Jardim Baiano, 40050-300 Salvador BA, Brazil

Laudelino Passos Almeida,

Rua Rio Trobogy 806, Lot Veredas Piatã, C19,  
41650-295 Salvador BA, Brazil

**Summary** Two new species of *Volvarina* from Itapuã beach, Bahia, Brazil, are described, *Volvarina aurantia* sp. nov. and *Volvarina rosalingae* sp. nov., completing Bavay's publications of 1906 to 1913, Boyer in 2000 and Cossignani from 2006 to 2017.

**Key words** Brazilian Province, Sub Province Bahia, Marginellidae, *Volvarina*

### Introduction

Bavay described the species *Volvarina serrei* in 1913 from shells collected dead by the consul Mr Serre under the name *Marginella (Volvaria) serrei*, as well as *Marginella joubini* (renamed *V. bahiensis* as the name *V joubini* was already occupied), and *Marginella (Volvaria) germaini* that turned later *Volvarina germaini*

We could distinguish *V. serrei* from *V germaini* even if they were synonymized earlier, *germaini* measuring 4 to 5 mm against 7 to 8 mm for *serrei*, a clearly more transparent shell and the 3 fine golden lines ornamenting *germaini*.

And Bavay, even after having initially described *V. serrei* as white, did add a tawny form

Later Franck Boyer revised the species described from Brazil by Bavay in his article The genus *Volvarina* (Volutacea:Marginellidae) in Brazil. Part 1 : revision of the species described by A. Bavay and closely related species, where he described *Volvarina brasiliensis* characterized by a transparent creamy white to beige shell with four spiral orange bands and *Volvarina tunicata* from Guarapari (Espírito Santo) that we couldn't find in Itapuã. Finally Cossignani described *Volvarina tripartita* from Recife with its low spire that we find only exceptionally in Itapuã.

And we added in 2022 a tiny species called *Volvarina megapex* with a prominent apex

Taking into account the diversity of the *Volvarinas* we could find in the sand from Itapuã beach in Salvador, Bahia, we have tried to clarify the species and our conclusion is translated by the description of two new species from the complex *Volvarina serrei* Bavay 1913: *Volvarina aurantia* sp. nov., and *Volvarina rosalingae* sp. nov.

### Material and methods

We initially focussed on harvesting dead shells in the sand or shells in water pools at low tide (fresh dead as much as possible) but Franck Boyer recommended that we lift stones in order to capture alive individuals.

Despite their relative quick speed we started capturing individuals on both Itapuã and Barra beaches, Salvador, collecting shells stored in 90% alcohol.

This allows us to see the mantle of each species, increasing the possible criteria of distinction between species and validating if the color differences between alive shells and dead shells do correspond.

In counterpart the shells we could catch alive are small sized compared to the dead ones, probably because the bigger individuals live at deeper horizon.

### Systematic Description:

Volutacea Rafinesque, 1815

Marginellidae J. Fleming, 1828

Marginellinae J. Fleming, 1828

*Volvarina* Hinds, 1841

Type species *Volvarina mitrella* (Risso, 1826)

### Type Material

#### *Volvarina aurantia* sp. nov.

Holotype registered as MNRJ24611 height 5,5 mm width 2,6 mm aperture 4,3 mm

Paratypes: two shells in Olivier Crabos collection : Paratype 1 height 5,5 mm width 2,7 mm, Paratype 2 height 5,4 mm width 2,5 mm

#### *Volvarina rosalingae* sp. nov.

Holotype registered as MNRJ24612 height 7,8 mm width 3,7 mm aperture 6,4 mm

Paratypes : two shells in Olivier Crabos collection : Paratype 1 height 8,2 mm width 3,7 mm, Paratype 2 height 8,0 mm width 3,6 mm

**Description:**

*Volvarina aurantia* sp. nov. shell measures 5 to 6 mm long and 2 to 2,5 mm wide, clearly shorter than the species we compare it to (*V. brasiliiana* 7/9 mm, *V. serrei* 5/8 mm), oval shaped with a quite straight edge on dorsal view, orange coloured with concolor apex, and its lower part is tainted with darker orange, the shell is more shiny than the other *Volvarinas* from Itapuã. Caught alive we can distinguish it from *V. serrei* by its white and pink mantle with a clearly higher proportion of pink than for *serrei*.

*Volvarina rosalingae* sp. nov. shell measures 8 to 9 mm long and 3,2 to 3,6 mm wide, with a beige orange shell, showing one or two light brown stripes, one under the spire and sometimes one in the middle of the last whorl and the apex (protoconch) is pink, criteria that distinguishes this species from the other species present in Itapuã, *V. aurantia*, *brasiliiana* and *serrei*. The border groove is more marked than the other volvarines found in this region.

It does roughly look like *V. brasiliiana* by its shell colour, but it is wider and does not carry the four lines characteristic from *brasiliiana*.

**Type locality**

For both species the type locality is Itapuã Beach in Salvador, Bahia, Brazil, in 0 to 1 meter water for *V. aurantium* found in sand under rock (we do not know the depth of *V. rosalingae* that we could not yet find alive.).

**Remarks**

Even if A Bavay acknowledged the existence of a fawn-coloured species in Salvador as *Volvarina serrei* var *fulva*, we do think that this variety *fulva* is a mix of shells of different species as *brasiliiana*, *aurantia*, and *rosalingae*, and as Bavay only indicates difference of color without any other detail we believe this variety should not be taken into account.

The main question then is to understand if *V. serrei* is white because its color was erased or if it is white alive. Capturing this species alive allowed us to assert that it is translucent white when alive. Even if it is possible that other species turn white when erased and thus confused with *V. serrei*. More especially as *V. serrei* is the more cosmopolitan of the Brazilian species, signaled from Para State (on the Equatorial line Dat the entrance of the Amazon river) until São Paulo shores (at Capricorn Tropic level), increasing the risk of containing different species under that name...

**Distribution**

These two species were only recorded from Itapuã Beach, Salvador, Bahia, Brazil.

**Discussion**

Even if Itapuã Beach probably contains the higher number of *Volvarina* species in Brazil (from smaller to bigger : *megapex*, *germaini*, *bahiensis*, *aurantia*, *serrei*, *brasiliiana*, *rosalingae* and *tripartita*), we do think that the *serrei* complex is probably hiding sister species difficult to distinguish without a careful study of alive shells, including anatomy, radula, DNA, which means a long term study.

*V. aurantia* seems easy to distinguish by the intensity of its orange colouration, the truncated shape of its shell.

Identically, the pink protoconch seems sufficient to isolate *V. rosalingae* from the Other species described in Brazil. We observed the main differences between species in an analytic table figured here as Fig 1.

**Etymology**

*Aurantia* means orange colour in latin, and this corresponds to the shell colour of *V. aurantia*.

*rosalingae* comes from the fusion between *rosa* for the apex colour with *Linda* which is the abbreviated name of Lindinalva R. da Silva, wife of the co-author Olivier Crabos.

**Acknowledgments**

We do thank the National Museum of Rio de Janeiro, Brazil, and wish to help this structure to rebuild its collections that did partially burn in 2018. With a special emphasis we thank Alexandre Pimenta who photographed, measured and kept the holotypes.

**Bibliographic references**

BAVAY, A. 1913. Sables de Bahia récoltés par M. Serre, consul de France. *Bulletin du Muséum National d'Histoire Naturelle*. 19: 359-360; 481-483.

BOYER, F. 2000. The genus *Volvarina* (Volutacea : Marginellidae) in Brazil. Part I: revision of the species described by A. Bavay, and closely related species, in *Novapex*, 1 (2). 35-55, June, Belgium.

COSSIGNANI, T. 2006. Una nuova volvarina dal Brasile, in Mostra Mondiale 51: Cupra Maritima, p. 10, April, Italy.

RIOS E. 2009, Compendium of Brazilian Sea shells, UFRG, p. 279-287, Rio Grande RS, Brazil,

QUEIROZ, CRABOS, POMONET and PASSOS 2022, Description of a new Marginellidae from North East Brazil, *Xenophora Taxonomy* 35, p 17-19, AFC, Paris

QUEIROZ and CRABOS 2023, Description of a new *Volvarina* (Volutacea: Marginellidae) from North-East Brazil, *Xenophora Taxonomy* 38, p 14-16, AFC, Paris

Fig. 1.

Analytic board of Brazilian Volvarinas with 5 to 10 mm average size present in Bahia and Espírito Santo

|                             | <i>Volvarina aurantia</i>   | <i>Volvarina serrei</i>           | <i>Volvarina brasiliensis</i>            | <i>Volvarina rosaliae</i>                         | <i>Volvarina tunicata</i>               | <i>Volvarina tripartita</i> |
|-----------------------------|-----------------------------|-----------------------------------|------------------------------------------|---------------------------------------------------|-----------------------------------------|-----------------------------|
| average size mm             | 5                           | 7                                 | 7                                        | 8                                                 | 8                                       | 8                           |
| size variation mm           | 4.5 to 6                    | 6 to 8                            | 7 to 9                                   | 8 to 9                                            | 7 to 9                                  | 8 to 10 (13?)               |
| color                       | shiny orange                | white to cream, relatively opaque | beige with 4 complete orange brown lines | orange with 0 to 2 discrete darker lines          | creamy orange with 1 to 2 white stripes | beige to light brown        |
| shape                       | truncated                   | oval                              | the straighter                           | proportions idem serrei                           | curved                                  | straight                    |
| other particularities       | darker edge on lower dorsum |                                   | asymetric spire                          | pink protoconch, lower edge on dorsum more marked | convex labrum                           | low spire                   |
| number of columellar plaits | 3 to 4                      | 3 to 5                            | 4                                        | 3 to 4                                            | 4                                       | 4                           |
| location                    | Itapuã, Salvador, Bahia     | Para to São Paulo theoretically   | Rio Grande do Norte to Espírito Santo    | Itapuã, Salvador, Bahia                           | Guarapari, Espírito Santo               | Maranhão to Rio de Janeiro  |
| frequency                   | relatively common           | the more common                   | present in Itapuã, relatively common     | not common                                        | not present in Itapuã                   | very rare in Itapuã         |

*Volvarina aurantia* sp. nov.*volvarina serrei**Volvarina brasiliensis*

## Plate 1.



a: *Volvarina aurantia* n. sp. Holotype MNRJ 24611, 5.5 mm . b,c: *Volvarina aurantia* n. sp. Paratypes, Cll. OC 5.5 & 5.4 mm.  
 d: *Volvarina brasiliensis* Boyer, 2000.  
 e: *Volvarina rosaliae* n. sp. Holotype MNRJ 24612, 7.8 mm f, g: *Volvarina rosaliae* n. sp. Paratypes, Coll. OC. 8.2 & 8.0 mm. h: *Volvarina serrei* (Bavay, 1913).

DESCRIPTION OF TWO NEW SUBSPECIES OF *ANCILLA CASTANEA* (G. B. SOWERBY I, 1830):

*ANCILLA CASTANEA LUTOFLAVA* SSP. NOV.; *ANCILLA CASTANEA ALBOLUTEA* SSP. NOV.

AND NOTES ON A NEW COLOR FORM OF *ANCILLA CASTANEA* (G. B. SOWERBY I, 1830)

*ANCILLA CASTANEA F. AURANTIACA*

Scali Massimo ,  
Via F.lli Giovannini 51, 40026 Imola (BO),  
Italy  
email: [info@cypraea.info](mailto:info@cypraea.info)

## Introduction

Since the year 2002, I have been travelling around Oman on several shell trips. So I have had the opportunity to watch and collect many specimens of *Ancilla castanea* (Sowerby, G.B. I, 1830) in different locations along the Oman coast. Until the year 2016, I had always found two colour variations: the more common is the typical brown to dark chocolate colour (Pic.3)



Fig. 1: *Ancilla castanea* dark brown, orange, greyish/caramel and white morpho.

and another quite uncommon totally orange/reddish shell. In the year 2016 for the first time, I found a new population further north near the city of Sur in the Ash Sharqiyah South Governorate where the specimens presented quite different features in colour and in the habitat in which they live. The first feature that I noticed certainly was the shell colour which is greyish / caramel (very paler compared to all the specimens I had seen before). But another feature was very well defined: the colouration of the animal. Instead of white freckled with black (Pic.2) they all presented a yellow animal always freckled

with black (Pic.6).

During one of my last trips to Oman, I discovered one more new colour morpho totally white with some yellowish zones. I already knew that some “albino” specimens have been found in the past but, to my great surprise, what I discovered is not a single specimen but an entire population. I was able to collect tenth of specimens in an area of about one square km. And in that area and around I did not find any *castanea* of any colour other than white.

In my experience, all the colour variations of this species are represented by well-defined and located populations that don't mix one another except for the coexistence of the orange and brown forms in some of the Bar Al Hikman areas (Al Wusta governorate) and in Masirah island Ash Sharqiyah South Governorate. But I have never found a living specimen of the orange form. I started to look in the bibliography in order to check if some of these varieties were already described and found the original publication by G. B. Sowerby 1830 where effectively there is a reference to one colour variation : “... A variety occurs that is spread over with a beautiful cream-coloured enamel ....” (that in all probability refers to the new subspecies *Ancilla castanea lutoflava* Scali M., 2023 described below). In the publication by Kilburn : “Revision of the genus *Ancilla Lamarck, 1799*” (Mollusca *Olividae Ancillinae*) in the description of *Ancilla castanea* (pag.427) Kilburn writes:

*It lives in colonies from low-tide levels down to over 35 mt. generally in coral sand, rarely sandy mud, often on silting reefs or among boulders...*

Effectively we found the species in such kinds of habitats (also if mainly in sandy/muddy bottoms).

About the colouration, Kilburn writes:

“...Shell colouration does not appear to depend on substratum, both dark and light examples sometimes occurring in close proximity to each other...” (Mrs B.Glayzer, pers. comment)...

I dare to disagree with this comment because, as said before, in my experience there is an important connection between bathymetry, location, habitat, and colouration.

- *Ancilla castanea* (G. B. Sowerby I, 1830) (classical dark brown morpho)

The dark brown (chocolate) colour of this species is undoubtedly the most common and the species is present in many areas of the Oman coast, Masirah Island included. This has been also the first form I could find in the sandy/muddy tidal flats on Masirah Island. The shell is very attractive for its colour and the acute tip present in the bottom section of the labrum. The

animal is whitish-speckled with black spots (see pic. 2) and when extended, it covers the entire shell with a thick mantle. The living specimens are always hidden in the sand and they can be located only by looking for the tracks left on the surface during their movements. The colour of the shell is not very variable going from dark brown to very dark (almost black).



Fig. 2 : dark brown *Ancilla castanea* alive



Fig. 3 : brown and dark brown *Ancilla castanea*

#### Description :

#### Systematics

Family **Ancillariidae** Swainson, 1840

Genus **Ancilla**, Lamarck, 1799

Type species **Ancilla castanea** (G. B. Sowerby I, 1830)

***Ancilla castanea lutoflava* ssp. nov.** ( see Plate 1.)

**Derivatio nominis:** The name lutoflava is a combination of lutum = mud and flava = yellow

#### Description:

Elongate, oval shell. Spire rather acuminate with a white tip. Whorls developing from protoconch in three distinct colour bands whitish, brown and grey. The brown one is visible near the apex and dissolves in the last whorl reappearing in the lower part of the last whorl near the labrum and in the labrum outer edge. The whitish one is visible in all the whorls and is located on the top of shell near the suture. The grey one is the widest and gives the main color to the shell. There is a belt structure that runs around the shell in diagonal in the bottom formed by two grooves. The upper one is whitish, wider and well visible contrasting with the shell color. The lower one is more thin, grey as the shell and delimits the columellar callus.

The upper groove terminates in a typical acuminate tooth that protrudes from the labrum. The inner lip protrudes in a white thick columellar callus. The colouration of the animal is pale yellow with blackish freckling.



Fig. 4 : *Ancilla castanea lutoflava* ssp. nov.  
32,2mm Holotype (Museo Giovanni Capellini, Bologna)

#### Discussion

The colour of the animal is yellowish speckled with dark spots (Pic.6) instead of white with dark spots as in the classical dark brown *castanea* (Pic. 2). Moreover, the colour of the shell is pale grey so much different from the classica onel. The location of this population is near Ras Al Hadd in the fat east area of the Oman coast.

The habitat where for the first time I found this population is an area where a thin layer of soft mud covers a flat rocky bottom; After the first experience I was able to find another population with the same characteristics in a different location close to the first one. The bottom was very muddy and also thicker than the first one.

The different coloration of the shell and of the animal and the different habitat convinced me to consider this new morpho type as a new ecological subspecies.



Fig. 5: *Ancilla castanea lutoflava* ssp. nov. (with lateral view)



Fig. 6: *Ancilla castanea lutoflava*  
(Living specimen with its yellow animal)

## Systematics

Family **Ancillariidae** Swainson, 1840

Genus ***Ancilla***, Lamarck, 1799

Type species ***Ancilla castanea*** (G. B. Sowerby I, 1830)

***Ancilla castanea albolutea* ssp. nov.** ( see Plate 2.)

**Derivatio nominis:** The name *albolutea* is a combination of albus = white and lutum = mud

## Description:

Elongate, oval shell. Spire rather acuminate with a white tip encircled with a darker line at the apex. The body colour is totally whitish with pale yellow zones. A belt structure runs around the shell diagonally in the bottom formed by two grooves. The upper one is wider and well visible, and the lower one is thinner and delimits the columellar callus. The upper one terminates in a typical acuminate tooth that protrudes from the labrum. The inner lip protrudes in a white thick columellar callus. The colouration of the animal is whitish with blackish freckling.



**Fig. 7 :** *Ancilla castanea albolutea* ssp. nov.  
26,4 mm Holotype (Museo Giovanni Capellini, Bologna)

## Discussion

This is the last morpho type I found. It was really a surprise for me when I followed the usual track that this species leaves on the sand and took off a totally white shell from the bottom. It took some time to realize that it was a specimen of *Ancilla castanea*. At first, I thought to have found a single albino specimen but, soon after, some more specimens of the same colour came out from the sandy bottom. The colour of the shells is white but with pale yellow zones, this is the reason of the subspecies name. Nevertheless the animal is very similar to the one of the dark brown classical specimens in color. The average size is a little lower than all the other *castanea* morpho. The location where I found this population is a very small area in the Bar Al Hikman peninsula. In this area I didn't find any other *Ancilla castanea*. Also the *albolutea* population was absent in all the around areas.

**Notes on a new color form of *Ancilla castanea* (G. B. Sowerby I, 1830) *Ancilla castanea f.aurantiaca***

## Systematics

Family **Ancillariidae** Swainson, 1840

Genus ***Ancilla***, Lamarck, 1799

Type species ***Ancilla castanea*** (G. B. Sowerby I, 2023)

***Ancilla castanea f. aurantiaca***

## Derivatio nominis:

The name *aurantiaca* means orange colour.



**Fig. 8 :** *Ancilla castanea f. aurantiaca*  
26,4 mm Type (Coll. Scali Massimo)

## Discussion :

One population of this form is in a particular area on the northern coast in front of Masirah island. The colour of the shell is orange to red but, despite the remarkable quantity of existing specimens in that area I have never been able to find a living one. In the same location, normal brown *castanea* can be found but in a much smaller quantity. Moreover, no intermediates between the two forms seem to occur. I thought they are likely to be subfossil specimens nevertheless many specimens are glossy and seem to be very fresh dead. A more probable possibility is that the "aurantiaca" population live far from the area where I collected them, and the specimens are transported there by the sea currents and/or hermit crabs. This second hypothesis is plausible because I have heard about living specimens of this variety found in the North of Oman.



**Fig. 9 :** *Ancilla castanea f. aurantiaca*  
30,10 mm (Coll. Scali Massimo)



**Fig. 10 :** *Ancilla castanea f. aurantiaca*  
36,6 mm (Coll. Scali Massimo)

**Literature:**

- G. B. SOWERBY 1830: Species conchyliorum, or, Concise original descriptions and observations accompanied by figures of all the species of recent shells, with their varieties. Vol. I, part I., London
- R. N. KILBURN: Revision of the genus *Ancilla* Lamarck, 1799 (Mollusca Olividae Ancillinae)
- MARTINI UND CHEMNITZ 1878: Systematisches Conchylien - Cabinet
- Proceedings of the sixth european malacological congress Amsterdam 1977
- BOSCH, D. AND E., 1982, Seashells of Oman. Longman, ELT.
- BOSCH, DANCE, MOOLENBEEK, OLIVER, 1995, "Seashells of Eastern Arabia"

**Special thanks to:**

- The Bologna Capellini Museum for conserving the holotypes.
- My wife, Sandra Bolognesi for having accompanied and helped me in almost all malacological adventures over the past twenty years and for always distinguishing herself in the search for specimens with excellent skills.

Plate 1.



*Ancilla castanea lutoflava* sp. nov.  
Paratype 1, 28,4mm , Coll. Massimo Scali (MS)



*Ancilla castanea lutoflava* sp. nov.  
Paratype 2, 28,6 mm, Coll. MS.



*Ancilla castanea lutoflava* sp. nov.  
Paratype 3, 32,8 mm, Coll. MS.



*Ancilla castanea lutoflava* sp. nov.  
Paratype 4, 29,7 mm, Coll. MS.



*Ancilla castanea lutoflava* sp. nov.  
Paratype 5, 23,2 mm, Coll. MS.



*Ancilla castanea lutoflava* sp. nov.  
Paratype 6, 27,2 mm, Coll. MS.

Plate 2.



*Ancilla castanea albolutea* nov. sp. Paratype 1  
26,9 mm, Coll. MS.



*Ancilla castanea albolutea* nov. sp. Paratype 2  
25,9 mm, Coll. MS.



*Ancilla castanea albolutea* nov. sp. Paratype 3  
32,5 mm, Coll. MS.



*Ancilla castanea albolutea* nov. sp. Paratype 4  
26,1 mm, Coll. MS.



*Ancilla castanea albolutea* nov. sp. Paratype 5  
26,6 mm, Coll. MS.



*Ancilla castanea albolutea* nov. sp. Paratype 6  
24,2 mm, Coll. MS.



*Cymbiola nobilis*, Singapore, Juvenile 40 mm @ Pulau Semakau, Mar 08

Christos Zeimbekis  
P.O. Box 2, 84401 Naousa, Paros, Greece.  
Email: penias67@yahoo.com

Giannis Zaminos  
Markantonaki 10, 73141 Chania, Greece.  
Email: tzouras09@gmail.com

David P. Cilia  
Esplora (Malta Council for Science and Technology,  
Dawret Giovanni Bichi, KKR 1320 Kalkara, Malta. (corresponding author).  
Email: dpcilia@gmail.com

Thanasis Manousis  
P.O. Box 48 K, 57500 Epanomi, Greece.  
Email: athanasiosmanousis@gmail.com

## Keywords

Aegean archipelago, allochthonous, alien species, non-marine Mollusca, Greece, new record

## Abstract

New introductions of tropical terrestrial snails (Pulmonata: Achatinidae: Subulininae) into habitats in the Palaearctic are being recorded with accelerating frequency. This paper presents a new case study highlighting this phenomenon, as the invasive species *Allopeas gracile* (Hutton, 1834) is documented from Greece, specifically the Aegean portion of Crete, for the first time.

## Introduction

Biological invasion by allochthonous species is considered to be one of the most serious economic and environmental threats of our time (Canning-Clode *et al.*, 2015), with various pathways for introduction being employed by various taxonomic groupings of organisms. As far as land snails are concerned, accidental introductions with soil or vegetation are frequent, as are introductions effected through attachment of snails to vessels or their shipment in containers (Cowie & Robinson, 2003; Bergey *et al.*, 2014). Their immense diversity, with the worldwide sum of species-level taxa possibly exceeding 35,000 (Barker, 2001), often implies unfamiliarity with exotic species from the perspective of local researchers. This situation often leads to alien species remaining undetected, or even to be erroneously identified, for considerably long periods of time (e.g. Richling & von Proschwitz, 2021).

Several species of land snails have been collected from anthropogenic habitats (such as greenhouses), sometimes even very far outside of their native ranges. Examples in malacological literature are abundant; among others, Flasar & Kroupová (1976), Leiss & Reischütz (1996), Albrecht & Meng (1997), Horsák *et al.* (2004), Benocci *et al.* (2014), and Cameron (2016) demonstrate this suitably. Tropical species from the subfamily Subulininae Fischer & Crosse, 1877 (in family Achatinidae Swainson, 1840) are heavily represented within the collective of tramp snails and slugs, and records of their presence in Palaearctic habitats are being published

with accelerating frequency (e.g. Benecke & Kappes, 1995; Anderson, 2005; Horsák *et al.*, 2019; Horsák *et al.*, 2020; Cilia *et al.*, 2022; Hausdorf, 2023).

As it is critical to report any introductions of alien species into a new area, the first record of *Allopeas gracile* (Hutton, 1834) from Greece (specifically from the Aegean coast of the island of Crete) is being presented herein. The record is also essential for updating the EASIN [European Alien Species Information Network] database (<https://easin.jrc.ec.europa.eu/easin>) (Katsanevakis *et al.*, 2012).

## Results

**Material studied:** One shell was collected from biogenic detritus from the estuaries of Moronis river, in Souda bay, on the island of Crete (Greece, 35°29'38N, 24°03'40E) (Fig. 1), after the torrential rain in January of 2020. The studied shell of *Allopeas gracile* (Hutton, 1834) (Fig. 2) is semi-transparent, yellowish light brown, 8mm in height and 2mm in width (h/w = 4), with a silky blurry lustre, and distinct, slightly prosocline growth lines in the form of thread-like axial ribs. The protoconch occupies 1 whorl and the teleoconch 5 whorls, the last of which constitutes about 48% of the shell's total height. The aperture is tear-shaped and measures about 30% of the shell's total height. The specimen is deposited in the collection of one of the authors (C. Zeimbekis), and may be accessed for inspection by prior appointment.

**Diagnosis:** Dextral and thin, grey-brown to yellow-brown shell, up to around 10mm high, with 6 to 8 moderately convex whorls that increase in size proportionally, resulting in an acutely angled and lanceolate shell outline. Protoconch obtuse and globular. Surface is smooth, somewhat glossy, with distinctly arcuate growth lines. The body whorl occupies around half the height of the shell, and the maximum width around a third. Columella continuous and slightly reflected, umbilicus generally absent. The aperture is long and the peristome is not thickened. For a conchological iconography that takes into account the range of intraspecific morphological plasticity expressed by *A. gracile*, reference can be made to Pilsbry (1946 sub *Lamellaxis gracilis*: figs. 85F-G), Christensen & Kirch (1981 sub *Lamellaxis gracilis*: fig. 2F), Neubert (1998: fig. 67), Schileyko (1999: fig.

660A), Bieler & Slapcinsky (2000: fig. 15), Feulner & Green (2003: fig. 10), Al-Khayat (2010: fig. 5), Miquel & Herrera (2014 sub *Lamellaxis gracilis*: fig. 39), Christensen & Weisler (2017: fig. 1), Foon *et al.* (2017: fig. 29B), Inkhavilay *et al.* (2019: figs 21A-C), Reitano *et al.* (2019 sub *Agathina mandralisci*: figs 4-7), Horsák *et al.* (2020: fig. 1C), Naser (2020: fig. 1), Neubert & Bochud (2020: figs 15A-C), Quiñonero-Salgado & López-Soriano (2020 sub *Subulina octona* [non Bruguière, 1789]: fig. 1), Sutcharit *et al.* (2020: fig. 9A), Marzuki *et al.* (2021: fig. 20B), and Hausdorf (2023: 5, fig. 1D). Anatomical illustrations are provided by Pilsbry (1946 sub *Lamellaxis gracilis*: figs. 84.8-10) and Schileyko (1999: fig. 660B).

**Distribution:** [For this section, biogeographical nomenclature follows Morrone (2015)]. No palaeontological or archaeological records support the assumption by Pilsbry (1946 sub *Lamellaxis gracilis*) and some subsequent malacologists (e.g. Solem, 1964; Neck, 1976 sub *Lamellaxis gracilis*; Auffenberg & Stange, 1988; Cowie, 1997; Bieler & Slapcinsky, 2000; Miquel & Herrera, 2014) that *Allopeas gracile* is a Neotropical species. On the other hand, many discoveries in that context from the Old World have been documented. The comprehensive summary of these records collated by Christensen & Weisler (2013) serves to advance their hypothesis for an Old World origin for *A. gracile*. For archaeological records from Pacific islands, including shells of up to 3000 years old, the reader is referred to finds from the Solomon Islands (Christensen & Kirch, 1981 sub *Lamellaxis gracilis*; Leach & Davidson, 2008 sub *Opeas gracile*; Christensen & Weisler, 2017), the Marshall Islands (Christensen & Weisler, 2013), and the Republic of Fiji (Hunt, 1981 sub *Lamellaxis gracilis*). Ethiopian and Oriental bioregions are represented by 8000 year-old specimens from Kenya (Leakey, 1931 sub *Opeas tangaense* [synonym according to Rowson, 2007 sub *Lamellaxis gracile*]) and presumed Quaternary specimens from India (Wadhawan & Kumar, 1996 sub *Opeas gracile*), incidentally the subcontinent containing the locus typicus established in Hutton's original description (1846 sub *Bulimus gracilis*), 'Mirzapoor' (= Mirzapur, Uttar Pradesh?). Within the Palaearctic and Saharo-Arabian realms, archaeological finds of *A. gracile* are noted for Pakistan (Theobald, 1877 sub *Opeas gracilis*), Egypt (Butzer, 1964 sub *Lamellaxis gracilis*), Bahrain (Glover, 1995), and the United Arab Emirates (Feulner & Green, 2003). This region is also home to extant populations of *A. gracile*; with data in recent years emerging from Egypt (Naggs, 1990; Ali & Robinson, 2020), Iran (Naggs, 1990), the Arabian peninsula and islands surrounding it (Neubert, 1998; Al-Khayat, 2010; Neubert & Bochud, 2020), Iraq (Naser, 2010), and Israel (Vaisman *et al.*, 2020).

In Europe, it seems that the first shell of *A. gracile* was found in Palermo (Sicily, Italy). Calcara (1840) described this single shell, which was probably imported with exotic plants, as *Agathina mandralisci*, though nowhere in the publication does he refer to it as a type specimen. Examination of the shell's current repository, namely the Monterosato collection in the University of Catania (Sicily, Italy), allowed Reitano *et al.* (2019) to synonymize *A. mandralisci* with *A. gracile*. The remaining European records include two from England (the first from specimens collected in 1917 but only identified and published by Naggs in 1990; and the second by Preece & White, in 2012), Germany (Jaekel & Plate, 1967), Austria (Reischütz, 2012; Reischütz *et al.*, 2012; 2018), the Netherlands (Da Sois, 2015), Spain and Tenerife (Quiñonero-Salgado & López-

Soriano, 2020; Hausdorf, 2023), and two separate finds from localities in Malta (Cilia, Nappo & Cardona, in preparation). The present study highlights the first find in Greece and the second published record from a Mediterranean island.

**Similar species:** No native landsnails of Crete display a combination of form and dimensions similar to those of *Allopeas gracile* (see Welter-Schultes, 2012). Other invasive subulinins are, at first glance, similar, mainly due the elongated shell and a brown to yellow animal. However, *Subulina octona* (Bruguière, 1789) and *Striosubulina striatella* (Rang, 1831) are larger, and feature much larger and globular protoconchs together with distinctly truncated columellae. *Allopeas clavulinum* (Potiez & Michaud, 1838) [= *Allopeas mauritanum* (Pfeiffer, 1853)] is generally smaller (up to 7mm high) and is more inflated (lower height-to-diameter ratio). Furthermore, the shell of *A. clavulinum* is smoother with fainter (almost absent) sculpture, and a distinct notch is apparent between the free end of the peristome and its attachment to the last whorl. The protoconch of *Paropeas achatinaceum* (Pfeiffer, 1846) is narrower, and its whorls increase in size more exponentially than proportionally, ultimately resulting in a less lanceolate and more turritiform shape than that expressed by *A. gracile*. The shell of *P. achatinaceum* is altogether more rugose and less glossy than that of *A. gracile*. Finally, mature specimens of both *Opeas hannense* (Rang, 1831) [= *Opeas pumilum* (Pfeiffer, 1840)] and *Opeas pyrgula* Schmacker & Boettger, 1891 are smaller than *A. gracile* (around 5-6mm tall), with less regular striations. Like *A. clavulinum*, *O. hannense* displays a distinct backward curve to the edge of the aperture where it joins the suture.

**Remarks:** Establishment of *A. gracile* in areas to which it is not native may be optimized by a suite of biological and biochemical peculiarities it exhibits. To mention a few, these include: rapid growth rates; an ability of isolated individuals to reproduce on their own; high fecundity; nocturnal and interstitial activity; polyphagy and omnivory; a tolerance to certain pesticides; and a historically proven tendency for dispersal through a fundamentally synanthropic association (Dundee, 1970; Subba Rao *et al.*, 1980; Capinera, 2017; Horsák *et al.*, 2020). Additionally, abiotic factors such as a marginally warmer atmosphere may ameliorate the odds for successful molluscan invasions of the sort (Nandy & Aditya, 2022).

Considering the species richness of the (sub)family to which *A. gracile* belongs, coupled with the relative ease by which many of its species are displaced synanthropically, the number of subulinin species introduced into Europe within the next few years is set to rise (Horsák *et al.*, 2020; Bohatá & Patoka, 2023).

### Acknowledgements

The authors are grateful to the anonymous referees for their useful contributions to improve the publication and to Eike Neubert (Natural History Museum Bern, Switzerland), who shared useful information and literature.

### References

- ALBRECHT C., MENG S., 1997. Die Schnecken der Gewächshausanlagen des Erfurter Erwerbsgartenbaus (Mollusca: Gastropoda). *Thüringer Faunistische Abhandlungen* 4: 33-43.
- BENOCCI, A., MANGANELLI, G., GIUSTI, F., 2014. New records of non-indigenous molluscs in the Mediterranean

- basin: Two enigmatic alien gastropods from the Tuscan Archipelago (Italy). *J. Conchol.*, 41: 617-626.
- ALI R. F., ROBINSON D. G., 2020. Four records of new to Egypt gastropod species including the first reported tropical leather leaf slug *Laevicaulis alte* (d'A. de Férussac, 1822) (Pulmonata: Veronicellidae). *Zool. Ecol.*, 30 (2): 138-156.
- AL-KHAYAT J. A., 2010. First record of five terrestrial snails in the State of Qatar. *Turk. J. Zool.*, 34 (4): 539-545.
- ANDERSON R., 2005. An annotated list of the non marine Mollusca of Britain and Ireland. *J. Conchol.*, 38: 607-638.
- AUFFENBERG K., STANGE L. A., 1988. The Subulinidae of Florida. Florida Department of Agriculture and Consumer Services, Division of Plant Industry, *Entomol. Circ.*, 305: 1-4.
- BARKER G. M., 2001. *Gastropods on Land: Phylogeny, Diversity and Adaptive Morphology*. Pp. 1-146, in: G. M. Barker, ed., *The biology of terrestrial molluscs*. CABI Publishing, United Kingdom, 558 pp.
- BENECKE M., KAPPES H., 1995. Erstfundevierere fremdländischer Schneckenarten im Terrarium des Kölner Zoologischen Gartens. *Mitt. dtsch. malakozool. Ges.*, 55: 37.
- BERGEY E. A., FIGUEROA L. L., MATHER C. M., MARTIN R. J., RAY E. J., KURIEN J. T., WESTROP D. R., SURIYAWONG P., 2014. Trading in snails: plant nurseries as transport hubs for non-native species. *Biol. Invasions* 16 (7): 1441-1451. DOI 10.1007/s10530-013-0581-1.
- BIELER R., SLAPCINSKY J., 2000. A case study for the development of an island fauna: Recent terrestrial mollusks of Bermuda. *Nemouria*, 44: 1-99.
- BOHATÁ L., PATOKA J., 2023. Invasion potential of ornamental terrestrial gastropods in Europe based on climate matching. *Diversity*, 15(2): 272: 1-15.
- BUTZER K. W., 1964. Pleistocene palaeoclimates of the Kurkur Oasis, Egypt. *Can. Geogr.*, 8: 125-141.
- CALCARA P., 1840. Nuove specie di conchiglie. *Effemeridi scientifiche e letterarie per la Sicilia*, 30: 35-37.
- CAMERON R., 2016. *Slugs and snails. Collins New Naturalist Library*, Book 133, Harper Collins, U.K., 508 pp.
- CANNING-CODE J., MICHALCZYK K., VAINIKKA A., TURNER B., 2015. *Biological invasions in changing ecosystems : vectors, ecological impacts, management and predictions*. De Gruyter, Berlin, Germany, 488 pp.
- CAPINERA J. L., 2017. Biology and food habits of the invasive snail *Allopeas gracile* (Gastropoda: Subulinidae). *Fla. Entomol.*, 100 (1): 116-123.
- CHRISTENSEN C. C., KIRCH P. V., 1981. Non marine mollusks from archaeological sites on Tikopia, southeastern Solomon Islands. *Pac. Sci.*, 35 (1): 75-88.
- CHRISTENSEN C. C., WEISLER M. I., 2013. Land snails from archaeological sites in the Marshall Islands, with remarks on prehistoric translocations in tropical Oceania. *Pac. Sci.*, 67 (1): 81-104.
- CHRISTENSEN C. C., WEISLER M. I., 2017. A record of the invasive land snail *Allopeas gracile* (Hutton, 1834) (Pulmonata: Subulinidae) from a first millennium BC archaeological site in the southeastern Solomon Islands. *Archaeo+Malacology Newsletter*, 27: 2-4.
- CILIA D. P., NAPPO A., CARDONA S., 2022. Contributions to the malacology of Malta, IV & V: Second European record of *Paropeas achatinaceum* (L. Pfeiffer, 1846) (Gastropoda, Achatinidae) and an annotated checklist of allochthonous non-marine gastropods. *Boll. Malacol.*, 58: 126-142.
- COWIE R. H., 1997. Catalog and bibliography of the non indigenous non marine snails and slugs of the Hawaiian Islands. *Occas. Pap. Bernice P. Bishop. Mus.* 50: 1-66.
- COWIE R. H., ROBINSON D. G., 2003. *Pathways of introduction of non indigenous land and freshwater snails and slugs*. In: Ruiz G, Carlton JT, eds. *Invasive Species: Vectors and Management Strategies*. Washington, D.C.: Island Press, 93-122.
- DA SOIS L., 2015. Greenhouse gastropods of the Hortus botanicus Leiden (distribution) and other experiences in the Botanical Garden [Bachelor thesis]. Università degli studi di Padova, Padova, Italy, 47 pp
- DIVIŠEK J., MAÑAS M., LOŽEK V., 2019. Checklist and distribution maps of the molluscs of the Czech and Slovak Republics, <http://molluscasav.sk/malacology/checklist.htm>
- DUNDEE D. S., 1970. Introduced Gulf Coast molluscs. *Tulane Stud. Zool. Bot.*, 16: 101-115.
- FEULNER G. R., GREEN S. A., 2003. Terrestrial molluscs of the United Arab Emirates. *Mitt. dtsch. malakozool. Ges.*, 69/70: 23-34.
- FLASAR I., KROUPOVÁ V., 1976. Die Malakofauna der Gewächshäuser in Bratislava (Tschechoslowakei). *Malakologische Abhandlungen Staatliches Museum für Tierkunde Dresden*, 5: 139-154.
- FOON J. K., CLEMENTS G. R., LIEW T. S., 2017. Diversity and biogeography of land snails (Mollusca, Gastropoda) in the limestone hills of Perak, Peninsular Malaysia. *ZooKeys*, 682: 1-94.
- GLOVER E., 1995. Molluscan evidence for diet and environment at Saar in the early second millennium BC. *Arab. Archaeol. Epigr.*, 6: 157-179.
- HAUSDORF B., 2023. Distribution patterns of established alien land snail species in the Western Palaearctic Region. *NeoBiota*, 81: 1-32.
- HORSÁK M., DVOŘÁK L., JUŘÍČKOVÁ L., 2004. Greenhouse gastropods of the Czech Republic: current stage of research. *Malacol. Newsletter*, 22: 141-147.
- HORSÁK M., NAGGS F., BACKELJAU T., 2020. *Paropeas achatinaceum* (Pfeiffer, 1846) and other alien subulinine and opeatine land snails in European greenhouses (Gastropoda, Achatinidae). *Malacologia*, 63 (1): 123-130.
- HUNT T. L., 1981. New evidence for early horticulture in Fiji. *J. Polyn. Soc.*, 90: 259-266.
- HUTTON T., 1834. On the land shells of India. *J. Asiat. Soc. Bengal*, 3 (26): 81-93.
- INKHAVILAY K., SUTCHARIT C., BANTAOWONG U., CHANABUN R., SIRIWUT W., SRISONCHAI R., PHOLYOTHA A., JIRAPATRASILP P., PANHA S., 2019. Annotated checklist of the terrestrial molluscs from Laos (Mollusca, Gastropoda). *ZooKeys* 834: 1-166.
- JAECKEL S. H., PLATE H. P., 1967. Land- und Süßwasserschnecken aus den Gewächshäusern des Botanischen Gartens Berlin Dahlem. *Zeitschrift für Angewandte Zoologie* 54: 361-371
- KATSANEVAKIS S., BOGUCARSKIS K., GATTO F., VANDERKERKHOVE J., DERIU I., CARDOSO A. S., 2012. Building the European Alien Species Information

- Network (EASIN): a novel approach for the exploration of distributed alien species data. *BiolInvasions Rec.*, 1: 235–245.
- LEACH F., DAVIDSON J., 2008. Archaeology on Taumako, a Polynesian outlier in the eastern Solomon Islands. *New Zealand Journal of Archaeology* Special Publication [unnumbered] i-x + 1-519.
- LEAKEY L. S. B., 1931. *The Stone Age cultures of Kenya Colony*. Cambridge University Press, Cambridge, U.K., 288 pp
- LEISS A., REISCHÜTZ P. L., 1996. Ein Beitrag zur Kenntnis der Molluskenfauna der Gewächshäuser in Wien und Niederösterreich. *Wissenschaftliche Mitteilungen Niederösterreichisches Landesmuseum*, 9: 173–184.
- MARZUKI M. E. B., LIEW T. S., MOHD-AZLAN J., 2021. Land snails and slugs of Bau limestone hills, Sarawak (Malaysia, Borneo), with the descriptions of 13 new species. *ZooKeys*, 1035: 1-113.
- MIQUEL S. E., HERRERA H. W., 2014. Catalogue of terrestrial gastropods from Galápagos (except Bulimulidae and Succineidae) with description of a new species of *Ambrosiella* Odhner (Achatinellidae) (Mollusca: Gastropoda). *Archiv für Molluskenkunde*, 143 (2): 107-133.
- MORRONE J. J., 2015. Biogeographical regionalisation of the Andean region. *Zootaxa*, 3936: 207-236, <https://doi.org/10.11646/zootaxa.3936.2.3>
- NAGGS F., 1990. A catalogue of the family Subulinidae (Pulmonata, Mollusca) in the general collection of the Natural History Museum London. Natural History Museum, London, U.K., 85 pp
- NAGGS F., 1994. The reproductive anatomy of *Paropeas achatinaceum* and a new concept of *Paropeas* (Pulmonata: Achatinoidea: Subulinidae). *J. Molluscan Stud.*, 60: 175-191.
- NANDY G., ADITYA G., 2022. Temperature dependent variations of life history traits of the land snail *Allopeas gracile* (Hutton, 1834) (Gastropoda: Subulinidae). *J. Therm. Biol.*, 108: 1–11.
- NASER M. D., 2010. New record of the land snail *Allopeas gracilis* (Hutton, 1834) (Gastropoda: Subulinidae) from Basrah area, Iraq. *Jordan J. Biol. Sci.*, 3: 55-56.
- NECK R. W., 1976. Adventive land snails in the Brownsville, Texas area. *The Southwestern Naturalist*, 21: 133-135.
- NEUBERT E., 1998. Annotated checklist of the terrestrial and freshwater molluscs of the Arabian Peninsula. *Fauna Arab*, 17: 333-461.
- NEUBERT E., BOCHUD E., 2020. The continental malacofauna of Arabia and adjacent areas, VII. The family Achatinidae (Coeliacinae, Subulininae) in the Socotran Archipelago (Gastropoda, Pulmonata). *Rendiconti Lincei: Scienze Fisiche e Naturali*, 31: 655–676.
- PILSBRY H. A., 1946. Land Mollusca of North America (north of Mexico). Volume II Part 1. *Proc. Acad. Nat. Sci. Philadelphia Monographs* 3: i-viii + 1-520 + 1 pl.
- PREECE R. C., WHITE T. S., 2012. Land and freshwater molluscs in Cambridge Botanic Garden. *Nature in Cambridgeshire*, 54: 53-56.
- QUIÑONERO-SALGADO S., LÓPEZ-SORIANO J., 2020. First report of *Subulina octona* (Bruguière, 1789) (Gastropoda: Achatinidae) for the Iberian Peninsula. *Elona*, 2: 4-6.
- REISCHÜTZ P. L., 2012. *Veronicella* sp. (Veronicellidae: Pulmonata) – Ein weiterer “unexpected inhabitant” des Tropenhauses im Tiergarten Schönbrunn. *Nachrichtenblatt der Ersten Vorarlberger Malakologischen Gesellschaft*, 19: 15-16.
- REISCHÜTZ A., REISCHÜTZ P. L., FISCHER W., 2012. Beiträge zur Kenntnis der Molluskenfauna Niederösterreichs, XXVII. Nochmals zur Verbreitung von *Hygromia cinctella* (Draparnaud 1901) (Hygromiidae: Pulmonata: Gastropoda) in Niederösterreich und Wien. *Nachrichtenblatt der Ersten Vorarlberger Malakologischen Gesellschaft*, 19: 11-12.
- REISCHÜTZ A., REISCHÜTZ P. L., RICHLING I., GILLI C., 2018. Die Molluskenfauna des Botanischen Gartens der Universität Wien. *Nachrichtenblatt der Ersten Vorarlberger Malakologischen Gesellschaft*, 25: 31-41.
- REITANO A., LIBERTO F., COLOMBA M. S., SPARACIO I., SANHILIPPO R., 2019. Notes on some interesting species of Mollusca Gastropoda of the Monterosato collection from the Museum of Paleontology (Catania University, Italy). *Biodiver. J.*, 10 (4): 499-516.
- RICHLING I., PROSCHWITZ T. VON 2021. Identification problems of travelling snail species – new exotic introductions to tropical greenhouses in Gothenburg, Sweden (Gastropoda: Achatinellidae, Strobilopsidae, Helicarionidae). *Peer J*, 9 (e11185): 1-17.
- ROWSON B., 2007. Land molluscs of Zanzibar Island (Unguja), Tanzania, including a new species of *Gulella* (Pulmonata: Streptaxidae). *J. Conchol.*, 39: 425-466.
- SCHILEYKO A. A., 1999. Treatise on Recent terrestrial pulmonate molluscs. Part 4. Draparnaudiidae, Caryodidae, Macrocyclidae, Acavidae, Clavatoridae, Dorcasidae, Sculptariidae, Corillidae, Plectopylidae, Megalobulimidae, Strophocheilidae, Cerionidae, Achatinidae, Subulinidae, Glessulidae, Micractaeonidae, Ferussaciidae. *Ruthenica*, (Supplement 2): 437-564.
- SOLEM A., 1964. New records of New Caledonian non marine mollusks and an analysis of the introduced mollusks. *Pac. Sci.*, 18:130-137.
- SUBBA RAO N.V., RAUT S. K., MITRA S. C., 1980. Observations on the fecundity of the garden snail, *Opeas gracile* (Hutton) (Pulmonata: Subulinidae). *Proc. Zool. Soc. India*, 32: 107–110.
- SUTCHARIT C., THACH P., CHHUOY S., NGOR P. B., JERATTHITIKUL E., SIRIWUT W., SRISONCHAI R., NG T. H., PHOLYOTHA A., JIRAPATRASILP P., PANHA S., 2020. Annotated checklist of the land snail fauna from southern Cambodia (Mollusca, Gastropoda). *ZooKeys*, 948: 1-46.
- THEOBALD W., 1877. On the occurrence of erratics in the Potwar, and the deductions that must be drawn there from. *Records of the Geological Survey of India*, 10: 140-143.
- VAISMAN S., MIENIS H. K., RITTNER O., 2020. *Allopeas gracile*: Another exotic land snail discovered in Israel. *Triton*, 40: 21-25.
- WADHAWAN S. K., KUMAR V., 1996. Subsurface Quaternary Aeolian stratigraphy in the Ghaggar basin of Thar Desert, India. *J. Arid Environ.*, 32 (1): 37-51.
- WELTER-SCHULTES F. W., 2012. European non-marine molluscs, a guide for species identification., Planet Poster Editions, Göttingen, Germany, 679 + 78 pp



Figure 1: Map of Greece with a detail of the island of Crete. Arrow indicates collection site.

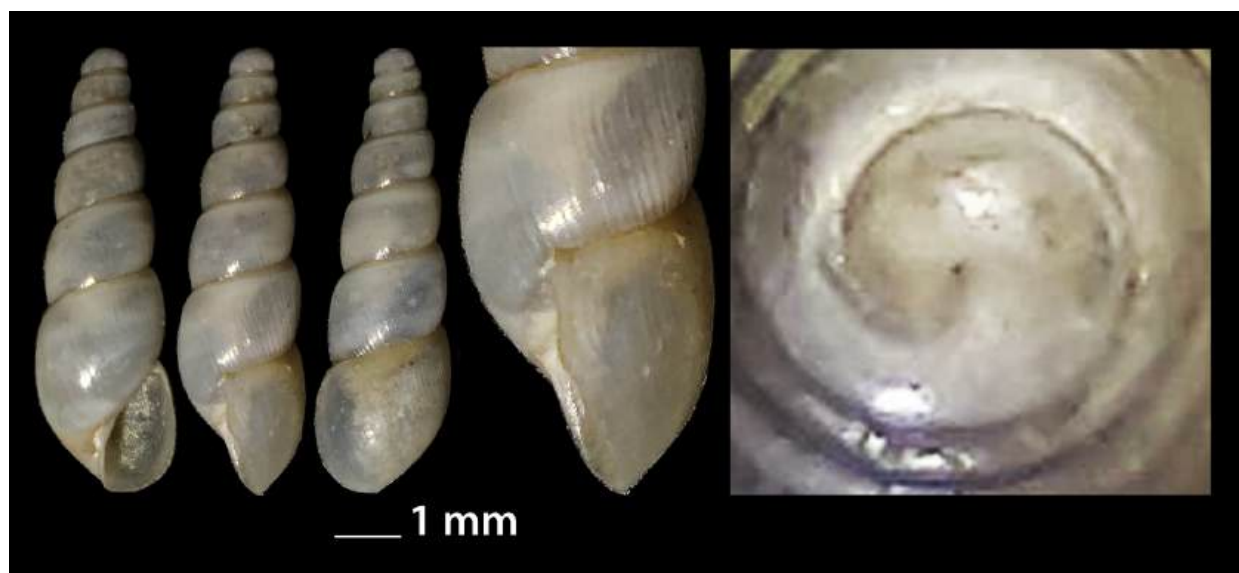


Figure 2: The specimen of *Allopeas gracile* (T. Hutton, 1834).

## ON THE TYPE SPECIMENS OF *CYMBIOLA CATHCARTIAE*

LUÍS A. AMBAR

[llsaa@netcabo.pt](mailto:llsaa@netcabo.pt)

Rua Gonçalves Zarco, 6F – 4º C, 1400-191 Lisboa, Portugal

ANTÓNIO MONTEIRO

[a.j.a.monteiro@gmail.com](mailto:a.j.a.monteiro@gmail.com)

Rua Carlos Calisto, 3 – 4 E, 1400-043 Lisboa, Portugal

In 1856, in the Proceedings of the Zoological Society of London, Lovell Reeve described a new species that, in his opinion, “will not admit of defined comparison with any known species.” He named it *Voluta cathcartiae*, after Mrs. McAdam Cathcart, to whose collection the specimen then belonged.

plate below) appears to be modeled on the image supplied by Reeve (Fig. 6) – although less sharp – so that it actually adds nothing to our knowledge of the species...

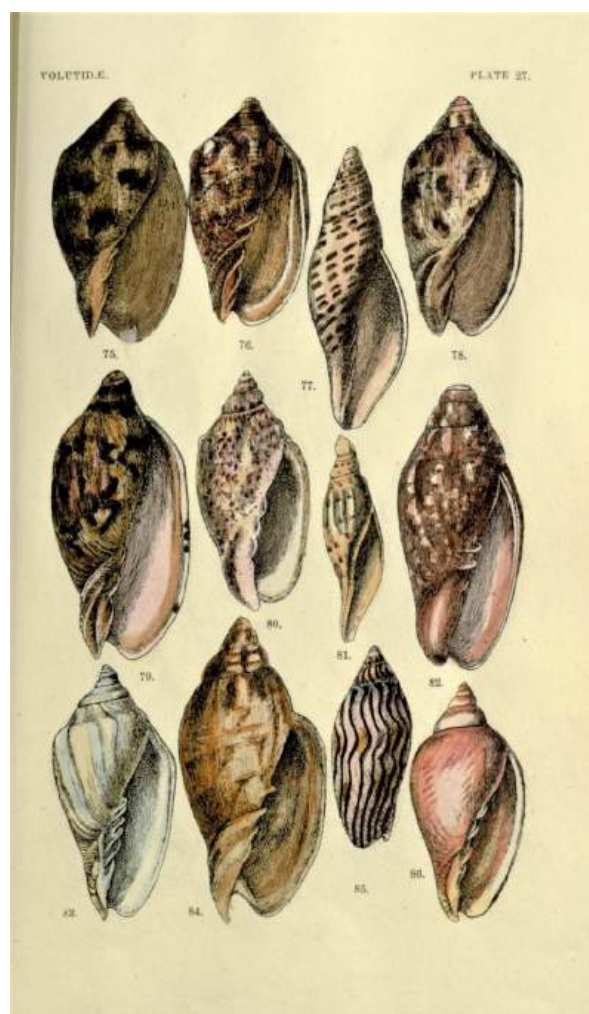
Once again, we find the indication of “unknown origin” that characterized the species for many years.



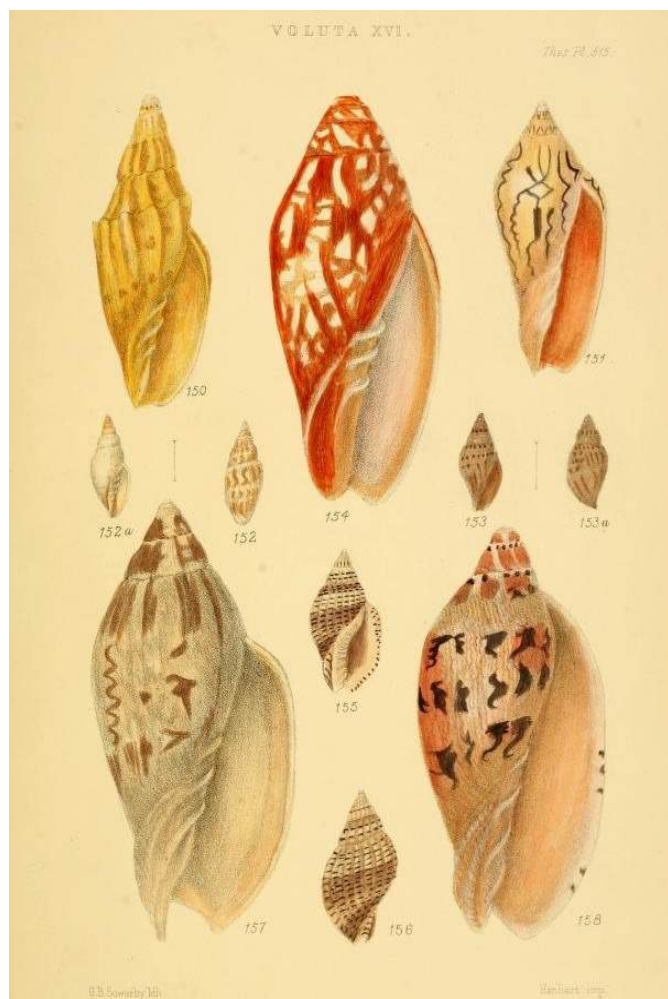
Figures 5 and 6 of the plate accompanying Reeve’s description (see above) constituted the lectotype of the new species, because the original specimen was considered lost, something that is confirmed in recent studies referring to the species. According to Reeve, that particular specimen would have a length of about 90 mm (Long. 3,5 poll.).

George Tryon also mentioned *Voluta cathcartiae* (Reeve, 1856) in his Manual of Conchology (vol. 4, dated 1882) as a valid species, adding a brief description and indicating its origin as unknown.

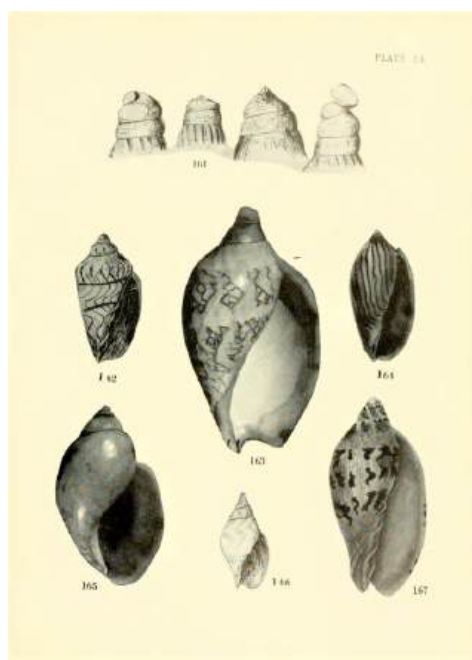
The illustration accompanying the description (fig. 79, on the



Sowerby’s Thesaurus Conchyliorum, published in 1887, again includes *Voluta cathcartiae*, but the image that now accompanies the description does not resemble Reeve’s lectotype. At the same time, Sowerby informs that “the only specimen of this elegant species is now in the Natural History Museum of Dijon,” which apparently confirms that he is not referring to Reeve’s specimen, supposedly lost forever ...



We would have to await the year of 1942 to see a new major publication devoted to volutes, Maxwell Smith's *Review of the Volutidae*.



*Review of the Volutidae, Pl. 24*

As far as *Aulica cathcartiae* is concerned, the author simply repeats what Sowerby had written (including the existence of that unique specimen at the Dijon museum), thus totally ignoring the description and illustration by Reeve; even the corresponding illustration (Pl. 24, Fig. 167) is copied from Thesaurus...

It is rather surprising that all present-day authors, including those who have recently studied the *Voluta aulica* complex, never mentioned the specimen referred to by both Sowerby and Maxwell Smith (and supposedly kept in the Dijon museum), always taking as lectotype for the species the figure presented by Reeve in 1856, as explained above. Could the Dijon specimen have been lost?

The first author got in touch with the Dijon museum, and was fortunate to contact someone who took an interest in the matter, namely Stéphane Puissant, an entomologist, who kindly agreed to conduct the necessary search in the museum's collections. Based on the available information, he at last managed to find the mysterious shell! It is certainly hard to understand how such a beautiful and conspicuous specimen went undetected along the much research doubtlessly undertaken, which spanned almost a century and a half.

That specimen of *Voluta cathcartiae* (nowadays included in the genus *Cymbiola*, thus becoming *Cymbiola cathcartiae* (Reeve, 1856)) belonged to the collection of a certain Mr. Grasset, which was given to the Museum of Natural History of Dijon, in 1885.

According to Stéphane Puissant, it was Jean-Philibert-Arthur Grasset (1828-1886) who donated part of his large shell collection to the Muséum d'Histoire Naturelle de Dijon (the remaining part went to the Museum of Lons-le-Saunier). Its importance justified the publication of a catalogue, with the title *Index Testaceorum Viventium*, from which, oddly enough, *Voluta cathcartiae* is absent! Could that particular specimen have been acquired at a later date?

Otherwise, everything is perfectly documented, including in a handwritten list of the specimens given, in which number 970 clearly refers to *Voluta cathcartiae*.

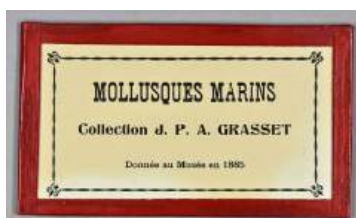
|                     |                      |
|---------------------|----------------------|
| 959. <i>porina</i>  | 960. <i>rubila</i>   |
| 961. <i>Neptuni</i> | 962. <i>Bucherii</i> |
| 963. <i>Neptuni</i> | 964. <i>Neptuni</i>  |
| 965. <i>Neptuni</i> | 966. <i>Neptuni</i>  |
| 967. <i>Neptuni</i> | 968. <i>Neptuni</i>  |
| 969. <i>Neptuni</i> | 970. <i>Neptuni</i>  |
| 971. <i>Neptuni</i> | 972. <i>Neptuni</i>  |
| 973. <i>Neptuni</i> | 974. <i>Neptuni</i>  |
| 975. <i>Neptuni</i> | 976. <i>Neptuni</i>  |
| 977. <i>Neptuni</i> | 978. <i>Neptuni</i>  |
| 979. <i>Neptuni</i> | 980. <i>Neptuni</i>  |
| 981. <i>Neptuni</i> | 982. <i>Neptuni</i>  |
| 983. <i>Neptuni</i> | 984. <i>Neptuni</i>  |
| 985. <i>Neptuni</i> | 986. <i>Neptuni</i>  |
| 987. <i>Neptuni</i> | 988. <i>Neptuni</i>  |
| 989. <i>Neptuni</i> | 990. <i>Neptuni</i>  |
| 991. <i>Neptuni</i> | 992. <i>Neptuni</i>  |
| 993. <i>Neptuni</i> | 994. <i>Neptuni</i>  |
| 995. <i>Neptuni</i> | 996. <i>Neptuni</i>  |
| 997. <i>Neptuni</i> | 998. <i>Neptuni</i>  |
| 999. <i>Neptuni</i> | 1000. <i>Neptuni</i> |



One of the drawers housing the Grasset collect in Dijon, where we can see the specimen of *V. cathcartiae* [Photo Stéphane Puissant]



An error crept into the old label accompanying the shell, which reads "cathcartia"



The specimen of *Voluta cathcartiae* belonging to the Musée d'Histoire Naturelle de Dijon (89.4 mm) [Photo Stéphane Puissant]

The location indicated for this specimen (Singapore) is most certainly a mere fantasy...

As noticed before, it is strange that no one appears to have looked for this specimen, the study of which could have prevented some confusions; it could probably be considered a paralectotype, certainly helpful to the understanding of the species.

Finally, it should be pointed out that in the number of Hawaiian Shell News for February 1962, a photograph of *C. cathcartiae* was published for the first time, the species having been represented only in engravings before. According to the author of the article, the well-known Volute specialist Clifton S. Weaver, the specimen illustrated would have been collected by native divers in the Island of Laminusa, Siasi, Philippines. Despite the poor quality of the printed black-and-white photo, its similarity to the specimen in Dijon specimen is clear, more so than with Reeve's lectotype.

At the end of his article, Weaver notices, after comparing it with the close *C. aulica*, that "it remains to be seen whether or not *cathcartiae* stays a valid species or becomes synonymized with *aulica*."

### Acknowledgements

The authors are greatly indebted to Stéphane Puissant, entomologist, Attaché de Conservation of the Natural History Museum of Dijon, for his invaluable help in locating a specimen that had been ignored for so long.

### References

- REEVE, LOVELL, "Description of Three New Volutes, from the Collections of the Hon. Mrs. Cathcart and Mr. Cuming", *Proceedings of the Zoological Society of London*, Part XXIV, 1856
- SMITH, MAXWELL, *Review of the Volutidae*, 1942
- SOWERBY, GEORGE B., *Thesaurus Conchylorum*, Vol. V, 1887
- TRYON, GEORGE, *Manual of Conchology*, vol. 4, 1882
- WEAVER, CLIFTON S., "Volute Problems", *Hawaiian Shell News*, Vol. X, No. 4 (New series No. 26), February 1962



**Association Française de Conchyliologie**

[www.xenophora.org](http://www.xenophora.org)

2 square La Fontaine

75016 Paris

