

# GLORIA MARIS

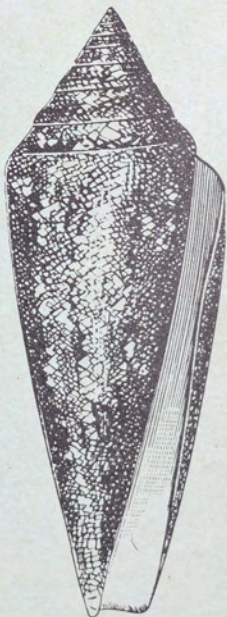
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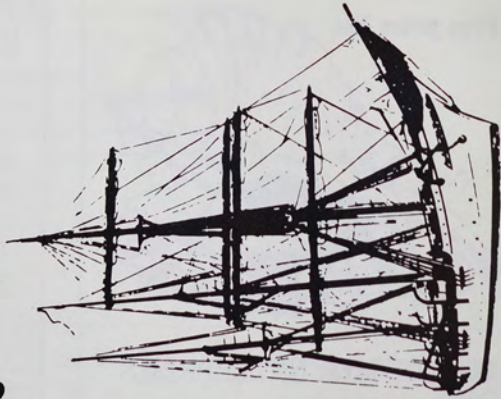
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**RED SEA MALACOLOGY****I****REVISION OF THE CHAMIDAE  
OF THE RED SEA****A. DELSAERDT**

This revision is dedicated to the late Dr. Isaac Yaron (1934-1985), who remains in our memories as a great malacologist and an engaging man.

His dream was a monograph on the mollusc fauna of the Red Sea. We tried hereby to realize only a fragment of Dr. Yaron's dream, knowing very well that we lack his knowledge, his experience, his professional approach, his very scientific accuracy and his malacological interest leading him to museums all over Europe...

Offered to Anina,  
Daphne and Dahlia,  
as a proof of our reverence for  
Jitzchak Yaron  
who was their beloved husband  
and father.



### DE FAMILIE CHAMIDAE

CHAMIDAE vormen een onvoorstelbaar moeilijke materie. Studie op het dier levert geen bruikbare kenmerken op om soorten te onderscheiden. Conchyliologisch stuit men binnen de meeste soorten op een variabiliteit die alleen overtroffen wordt door oesters. De substraat-vorm bijvoorbeeld kan de vastgehechte klep zo beïnvloeden dat slotkenmerken, spierindrucksels en mantellijn (heb je nog veel meer?) niet meer beantwoorden aan het verwachtingspatroon. Ecologische factoren maken de meeste exemplaren onherkenbaar verkalkt. Odhner (1919) concentreerde zich in een schitterende studie onder meer op de embryonale schelpjes (nepionic shell) - de bruikbaarheid bij determinatie is echter zeer klein.

Waar eindigt een soort en begint een andere? Een vraag die in deze familie vaak heel moeilijk is op te lossen. Van de prachtige monografie van Reeve maakte A.M. Cooke (wel wat overdreven) op dat de 55 beschreven soorten in werkelijkheid wellicht tot een tiental zijn terug te brengen! Desalniettemin beschrijven wij één nieuwe soort en twee nieuwe ondersoorten: Dat kan, want behalve de 19de eeuwse monografieën is de gespecialiseerde literatuur vrij beperkt. In recente algemene werken komt een *Chama* slechts sporadisch voor (cfr. SHARABATI, 1984). De auteur hoopt door deze te ontdekken of er nog ergens in de wereld iemand onweerstaanbaar uitgedaagd werd door de geheimzinnige CHAMIDAE.

## INTRODUCTION

The CHAMIDAE are a family of polymorphous bivalves, the specific identification of which is still quite chaotic. During the two hundred years of molluscan exploration and investigation from the area of the Red Sea numerous Chamid taxa have been recorded and named. Considerable material has accumulated in Museums and private collections which requires processing and publication. It has been felt for quite some time, that a review of the CHAMIDAE of the Red Sea, based on the analysis and reevaluation of literature records and on the examination of collected material, would be desirable.

For the purpose of this review all publications, pertaining to the malacofauna of the Red Sea, available has been covered, and a list of Chamid taxa recorded in these has been compiled...

Yaron, 1983. Manuscript.

There is no genus of acephalous mollusks, excepting perhaps the Oysters, whose shells are liable to such variation in form and general aspect, according to circumstances of habitation, as the Chamae... scarcely inferior in beauty and variety to the Spondyli.

Reeve, 1846. Conch. Icon.

Nearly each specimen is an identification-problem, with the exception of a few species. The animal - if preserved - does not give characteristics to distinguish the species. The morphology of the shells varies infinitely. Only by a long experience it is possible to separate specimens at the model of the types or the original figures.

The author.

## NOTES

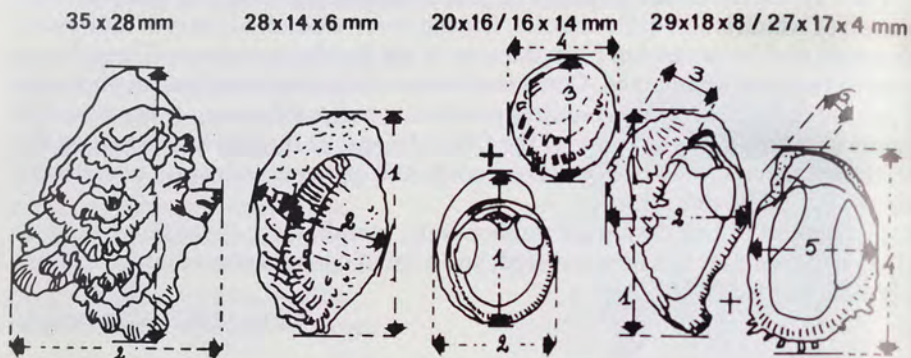
Species belong to the genus *Chama* when the left valve is attached to the substrate (these species are growing "counterclockwise"). It is a traditional and easier way to speak of the "attached valve" in counterpart of the "free valve" or "upper valve". Species belonging to the genus *Pseudochama* are attached by their right valve (they are growing "clockwise"). Not attached species of the genus *Arcinella* Schumacher, 1817 are not found in the Red Sea. We preferred to give species alphabetically regardless their genus.

Literature records are given as far as they concern the Red Sea or because of their importance. When an author's name is given in capitals (followed by date) we refer to the publication of this author.

Material records are given as far as personally handled by the present author himself, or in the case that they are clearly the mentioned species.

For the purpose of this revision the geographical limits of the Red Sea are set at the Straits of Bab el Mandeb in the South and at Port Said at the exit from the Suez Canal in the North. Interesting is the Suez Canal, being the connection between the Mediterranean and the Red Sea. Dredging in the Great Bitter Lake f. i. are mentioned too.

When the measurements of a specimen are given:



Abbreviations used in this revision:

- BMNH British Museum (Natural History), London, England.  
 HUI Zoological Museum, Hebrew University, Jerusalem, Israel.  
 KBIN Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussels.  
 MHNG Muséum d'Histoire Naturelle, Genève, Switzerland.  
 MNHN Muséum National d'Histoire Naturelle, Paris, France.  
 RNH Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands.  
 SMF Senckenberg Museum, Frankfurt, W. Germany.  
 TAU Zoological Museum, Tel Aviv University, Tel Aviv, Israel.  
 ZMA Zoologisch Museum, Amsterdam, The Netherlands.  
 ZMU Zoological Museum of the Uppsala University, Sweden.  
 Coll. author Private collection of the present author, Belgium.  
 Coll. Haviland Private collection of mr. Edg. Haviland, Clearwater, Florida, U.S.A.  
 Coll. Peled Private collection of mr. Dov Peled, Tivon, Israel.  
 Coll. Yaron Private collection of dr. Isaak Yaron, Beer-Sheva, Israel.

Family	<b>CHAMIDAE</b> Blainville, 1825. (correction of CHAMACAE -, ICZN, 1957. Opinion 484).
Type genus	<b>Chama</b> Linné, 1758.
Type species	<b>Chama lazarus</b> Linné, 1758. (S.D. Children, 1823. ICZN, 1957. Opinion 484) Species attached to the substrate by the left valve.
Genus	<b>Pseudochama</b> Odhner, 1917.
Type species	<b>Pseudochama cristella</b> (Lamarck, 1819). (S.D. Gardner, 1923) Species attached to the substrate by the right valve.



*Chama asperata* (sic) Lamarck.

*C. asperata* Lm. — Fr. Paetel, 1869: 109: "M. rubr."

*C. asperata* Lamarck — Issel, 1869: Appendice, 381 (ex Paetels Catalog).

*C. asparata* Lm. — Fr. Paetel, 1889: 121. "M. rubr."

*C. asparata* Lm. — Lamy, 1927: 360 (note). "Tout en indiquant *asperella* Lm. comme synonyme de *gyphoides* L. de la Méditerranée, le Catalogue Paetel (1890, III, p. 121) mentionne un *C. asparata* (sic.) Lm., de la Mer Rouge."

No description. No type. Even the name *C. asperata* can not be found in LAMARCK. *Asparata* is a misspelling for *asperata*, which must be considered a nomen nudum. Probably *C. asperata* (sic.) Lm. in PAETEL (1869) is an "incorrect subsequent spelling" (ICZN, 1985, 33 c) for *asperella* Lamarck (not mentioned in PAETEL, 1869) and, consequently, not an available name.

Material labeled *C. asperata* in SMF (168490/13 coll. E. Rüppell) and KBIN (Coll. Dautzenberg) is *C. asperella* Lamarck.

*Chama asperella* Lamarck, 1819.

*C. asperella* Lamarck, 1819. An. s. Vert., VI: 95.

*C. Spinosa* Broderip, 1834. P.Z.S.: 150.

*C. Spinosa* Broderip, 1834. Trans. Zool. Soc., I: 306, pl. 38, f. 8.

*C. jukesi* Reeve, 1847. Conch. Icon., IV: pl. VII, spec. 39.

*C. pellis-phocae* Reeve, 1847. Conch. Icon., IV: pl. IX, spec. 54.

*C. gyphoides* (non L.) Krauss, 1848. Südafr. Moll.: 19.

Original description. — "Ch. testa imbricata, albida, squamulis fornicatis sursum elevatis echinata; margine crenulato. (b) var.? testa squamulis brevioribus, subdecumbentibus."

Type material. — MNHN. Lectotype, hereby designated: white, 15 mm, labeled "Came aspérelle, *ch. asperella*" and "Individu nommé par Lamarck". The lectotype is figured on plate I, fig. 1.

First paralectotype: white, internally with purple margins, 20 mm, labeled by Lamarck "*chama asperella*, autre variété". Second paralectotype: white, 35 mm, labeled "*chama asperella* var. b", apparently collected by Péron & Lesueur (1803) in the Bay of Chiens-Marins, Australia.

All types are in the Lamarck collection, MNHN.

Type locality. — By original designation: "les mers australes". For the second paralectotype: "la baie des Chiens-Marins".

Distribution. — Broad Indo-Pacific. A well known Australian species. Commonly found during our Andaman-expedition (1). Also common in the Red Sea, including the Gulfs of Aqaba and Suez, and the Suez Canal (coll. Beets: Great Bitter Lake).

Habitat. — On littoral rocks, boulders and abraded dead rock, regularly found on cemented platform (Mastaller, 1978: 129).

Discussion. — *C. asperella* is a very variable species in general form and in form of the spines, with several synonyms.

LAMY (1917: 8-9; 1921: 240-241; 1927: 357-364) included *C. spinosa* Broderip, 1834 and *C. pellis-phocae* Reeve, 1847 in its synonymy. Lamy cited SMITH (1885: 127), who considered *C. jukesi* Reeve, 1847, *C. pellis-phocae* Reeve and *C. fibula* Reeve,

1846 as conspecific. Lamy mentioned also several specimens of *C. spinosa* Broderip, and *C. asperella* Lamarck. We figure the types of *C. spinosa* Broderip and *C. pellis-phocae* Reeve on plate I.

Concerning *C. jukesii* Reeve: LAMY (1921; 1927) regarded it merely as a completely white colour-form of *asperella* - whereas the typical *asperella* has a rose-coloured umbo on the free valve and internally often with purple stained margins. ODHNER (1919) on the other hand, regarded *jukesii* as a form of *C. reflexa* Reeve, 1846, while KIRA (1955: pl. 53, f. 11) as a subspecies of the latter. We cannot accept the opinions of Odhner and Kira because of the distinguishing marks of *C. reflexa* (= *C. pacifica* Brod.), as this species has always very crenulated margins f.i. Concurring with the opinions of Lamy, and according to Art. 45 of the ICZN, we place *jukesii*, a colour-form, in the synonymy of *C. asperella*.

Lamy (1921; 1927) further considered *C. unicornis* Bruguière, 1792 as a variety of *asperella*. The *unicornis*-form of the attached valve can be found, however, in specimens of several *Chama*- and *Pseudochama* species. Two well developed specimens of *C. asperella* forma *unicornis* from the Red Sea (MNHN) are shown on plate II, fig. 3. Lamy (idem) distinguished also another oblong form with short spines. However, as already stated, *asperella* is extremely variable in form.

MASTALLER (1979: 149) included in the synonymy of *C. asperella* also *C. broderipi* Reeve, 1846 - as recorded by TILLIER & BAVAY (1905: 177), MOAZZO (1939: 71) and BARASH & DANIN (1973: 377). The material, on which these records are based, could not be obtained so far for reexamination. We doubt these identifications as f.i. TILLIER & BAVAY recorded *C. broderipi* from the south of the Suez Canal to the Bitter Lakes. Beets collected a lot of specimens of *C. asperella* from the Great Bitter Lake, but no one *C. broderipi*, although he collected in 47 stations (BEETS, 1953: 104-106). However, examination of the holotype of *C. broderipi* Reeve (90 x 65 mm) in the BMNH, poorly figured in REEVE (1846: pl. I, f. 2), makes it clear that this belongs to a distinct species, which can not be confused with *C. asperella*.

DESHAYES (1835: 584) remarked on *C. asperella*: "Celle-ci vient de la Méditerranée, et elle est l'analogue vivant du *Chama echinulata* fossile. Il faudra donc (reunir) ces deux espèces."

The second paralectotype in MNHN closely resembles the fossil *C. echinulata* Lamarck which is related to the recent *C. gryphoides* Linné, 1758 (pars) from the Mediterranean. It is often very difficult to separate small specimens of *C. asperella* from *C. gryphoides* due to the similarity in general form, spine morphology, internal colouration, margins, the muscle-scars, etc. We ascribe to the great variability of both species the erroneous (in our opinion) synonymization of both in Paetels Catalogue (1890, III: 121). Study on the ancestor species is necessary, although SELLI (1973: 214-215) recorded *C. asperella* fossil "Quaternario: M. Rosso, G. d'Aden, Tanganika, Kenya."

Literature records from the Red Sea.

JOUSSEAUME (1888: 210) *C. jukesii*: Obock. Un exemplaire adulte et d'autres jeunes.

NEWTON (1900: 556) *C. jukesii*: Gharib lighthouse, raised beach 20 feet above sea (fossil).

ANTHONY (1905) Tadjourah.

LAMY (1921: 241) var. *jukesii*: Suez; Souakim; Massauoah; Obock; Djibouti; Périm; Aden.

LAMY (1938: 24) *C. asperella*: Ismailia (sur la coque d'un bateau); Sénafir; Mérsa Thlemel; plage de Ras Matarma; Golfe de Suez (11 stations).

MOAZZO (1939: 70) *C. asperella* and var. *jukesi*: Baie de Suez; Grand Lac Amer; Lac Timsah; Port-Tewfik; Chalouf; Kabret.

FRANC (1956: 57) *C. asperella*: Pointe de Requin, dans les blocs altérés; La Sécherie; Îlot Ouest, par 1-3 m; piles de la jetée du port de Djeddah.

MASTALLER (1978: 139) Port Sudan.

TAYLOR & REID (1984: 206-207) *C. asperella*: Harvet and Baraja Reefs.

Material in collections examined (2).

HUJ : 35763 Dahab (R. Plattner, 1974). 35768 Ras Muhammed (H.K. Mienis, 1969). Aqaba (G. Haas, 1949). 35781 Ethiopia (Oren, 1958).

KBIN : Dautz. coll., drawer 1573, *C. jukesi*: Aden (Jousseume, 8-10-1892).

MNHN : Ile Abulat (Miss. Cherbonnier). Al Sayad (Miss. Dollfus). Golfe de Tadjourah (Miss. Gravier; *jukesi* det. Lamy). Djibouti (Jousseume; *jukesi* det. Lamy). Aden (*unicornis* det. Lamy). Alcohol coll.: Djibouti (Coutière), Djibouti (Miss. Gravier). Périm, Suez (Jousseume).

RNH : Beets coll., Ras Matarma (strand, reg. 770); Great Bitter lake (dredging, 1950: a lot of material from a lot of stations proves *C. asperella* has been very common in the Gr. Bitter L.). (3).

TAU : Off Nuweiba el Tarabin (Lewinsohn, 1969, triang. dredge, 75-80 fm). Off Eilath (Lewinsohn, 1966, 34-50 fm). Off Mersa Abu Samra (Lew., 1969, 25-27 fm).

Eilat (D. Zalcman, 1970, Ockelman dredge, 300-200 m, Op. Lighthouse). Eilat (D. Zalc., 1970, Grab, 320 m, Op. Electri. Plant.). Eilat (D. Zalc., 1970, Grab, 270 m, Op. New Port). Eilat (D. Zalc., 1970, Ockelman dredge, 420-300 m, Op. Old Port). Eilat (D. Zalc., 1968, Grab, 121 m, Op. Old Port).

SMF : 168490 Rüppell coll.: Rotes Meer.

Coll. Yaron : 1161 Marsa el 'Et (1969: 1 valve). 3843 Nevioth, beach (1975: 4 specimens). 4026 Abu Zheime, beach (1969: 1 valve, forma *unicornis*).

Coll. author : Great Bitter Lake (leg. RNH). Massaua (leg. HUJ: 1 specimen, forma *unicornis*).

- (1) Nine members of the Belgian Society for Conchology (included the present author) hold an expedition for malacology to the South Andaman Islands in april 1983. Material in KBIN and in the private collections of the members of the expedition.
- (2) Material in collections is given as far as EXAMINED PERSONALLY by the present author and as FOUND IN THE RED SEA AND THE GULFS OF AQABA AND SUEZ.
- (3) BEETS (1953) (in) Zool. Mededelingen. Vol. XXXII, 10: list of stations.

### **Chama aspersa** Reeve, 1846.

*C. aspersa* Reeve, 1846, Conch. Icon., IV: pl. V, spec. 24.

*C. aeruginosa* (?) Lamarck, 1819, An. s. Vert.: 95.

*C. planata* Reeve, 1846. Conch. Icon., IV: pl. V, spec. 25.

Original description. — "Shell ovate, upper valve flattish, ornamented with profuse concentric rows of small vaulted spines, rather long and erect towards the margin, lower valve rather deeply convex, with very close-set lamellated scales, spine-shaped at the margin, margins of the valves smooth; white, rayed or sprinkled with rust-red." REEVE.

Type material. — The specimen described by Reeve is not present in the type collection of BMNH and must be cited as "not located". We select hereby as lectotype the specimen figured by Reeve (1846: pl. V, fig. 24).

Type locality. — By original designation: "Tacloban, Isle of Leyte, Philippines (attached to stones); Cuming."

Distribution. — The Great Bitter Lake, the Gulfs of Aqaba and Suez, the Red Sea and to the Philippines.

Discussion. — LAMY (1927: 364-366), following the opinion of HIDALGO

(1903), was convinced of the synonymy of *C. planata* Reeve, 1846 with *C. aspersa*, as Hidalgo wrote: "Dada la variabilidad... no son realmente de mucha importancia los caracteres dados por Reeve para establecer una especie distinta." We agree with this opinion: As Lamy already noted, one of the syntypes of *C. planata* is rayed with rust-red, a distinguishing mark for *C. aspersa*. He noted also that one of the figure *C. spinosa* Broderip, 1835 (pl. XXVIII, f. 9) shows this same mark!

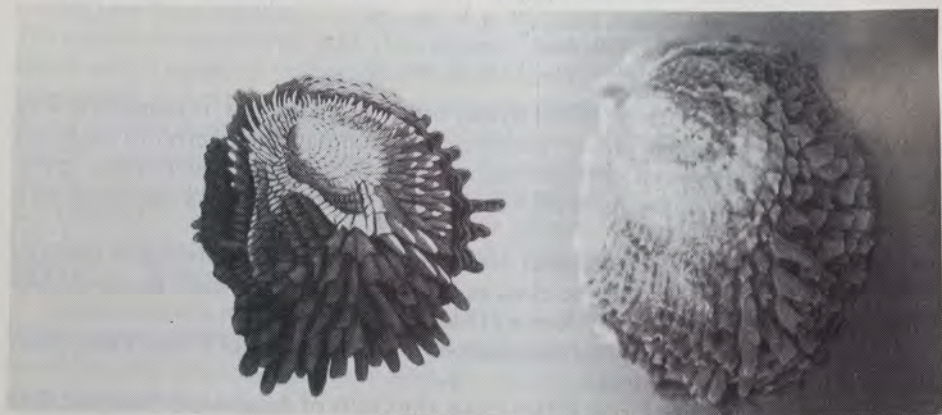
Lamy stated that *C. aeruginosa* Lamarck, 1819 is probably conspecific with *C. aspersa* because of several identical marks. The original description by Lamarck (1819: 95) for *C. aeruginosa*: "Ch. testa suborbiculari, rufo-rubente; valva majore subtus foliacea; alterae valvae squamis minimis fornicatis; margine integro." The holotype of *C. aeruginosa* is in MNHN, Lamarck collection, and is shown on plate I, fig. 6. Type locality: "Timor (Péron, 1803)". The figure of *C. aeruginosa* in CHENU (1843-1850: pl. V, fig. 7), see below does not resemble the holotype. The specimen figured in CHENU must be considered *C. pacifica* Broderip, 1834. However, because of the lack of more material to interpret *C. aeruginosa* Lamarck, we cannot take a decision.

We consider *C. aspersa* Reeve a valid species.

The similar *C. fibula* Reeve, 1846 can be separated as having minutely crenulated margins.

Lamy mentioned a lot of specimens of *C. aspersa*, collected in the Red Sea by dr. Jousseume. In RNH (Beets collection) specimens are kept from the Great Bitter Lake. Also in the RNH two specimens from the Philippines, by Sowerby & Fulton in 1914. *C. aspersa* from three sources on plate II. TADJALLI-POUR (1974) mentioned the species from the Persian Gulf. It must said that each specimen we examined was eroded. So the question is: These rust-red rays aren't they the left-overs from more prominent scales?

Hart (1891: 193) identified specimens from the Gulf of Aqaba and the Gulf of Suez: *C. obliquata* Reeve. It is possible that Hart is misguided by "its oblique triangular growth, darkly rayed" as REEVE (1846: species 28) distinguished *C. obliquata*. Probably the specimens mentioned by HART (1891) belong to *C. aspersa*.



Left: CHENU (pl. V, fig. 7): *C. aeruginosa* Lamarck (holotype: our pl. I, fig. 6).

Right: *C. aeruginosa* Lamarck (sensu CHENU), 64 x 49 mm, Coll. author. (= *C. pacifica*).

## Literature records

LAMY (1921: 307) Suez; Massaouah; Djibouti; Aden.

LAMY (1927: 366) idem + Périn (Jousseume).

LAMY (1938: 24) Plage de la baie de Suez.

MOAZZO (1939: 70) Grand Lac Amer; Lac Timsah; Petit Lac Amer; Kabret. "Généralement en compagnie du *Chama asperella*."

HUGHES (1977: 93) Jeddah.

MASTALLER (1979: 149) - cited localities by earlier authors.

TAYLOR & REID (1984: 206-207) Harvey Reef.

## Material

HUJ : 35775 Aqaba (coll. G. Haas, 1941: eroded valves)

35759 Elat (coll. Steinitz, 1956: free valves, attached valves on stones).

MNHN : Djibouti (coll. Jousseume, dét. Lamy).

RNH : Ras Matarma, Ras Gharib (coll. Beets, 1948/49: Gulf of Suez).

Great Bitter Lake (coll. Beets, 1950).

TAU : Off Eilath, 22-27 fm. (coll. Lewinsohn, 1966, 1 attached v.)

Coll. Yaron : 1162 Marsa el'Et, beach (1969: 4 valves).

Coll. author : Aqaba (leg. HUJ). Ras Matarma (leg. RNH).

***Chama brassica* Reeve, 1846.**

*C. brassica* Reeve, 1846. P.Z.S.: 119.

*C. brassica* Reeve, 1847. Conch. Icon., IV: pl. VI, spec. 31.

Original description. — "Cham. testa suborbiculari-ovata, circuiter trigona, valvis ambabus rugosis, profuse squamatis, squamis valvae superioris subfoliaceis, inferioris brevisbus, erectis; albida, squamis roseis." REEVE.

Type material. — Three syntypes are present in BMNH, all in gem condition. Measurements: 61 x 55 mm; 43 x 33 mm; 55 x 43 mm. Without any doubt the specimen with the measurements 61 x 55 mm is accurately figured in *Conchologia Iconica*, pl. VI, fig. 31. This specimen is hereby selected lectotype of *C. brassica* Reeve and is figured below. Consequently the two other type specimens become paralectotypes.

Type locality. — By original designation: "Island of Cabul, Philippines (under stones at low water); Cuming."

Distribution. — Indo-Pacific species (Coll. author: f.i. Solomon Islands), well known from the Philippines. Living in the Red Sea.

Discussion. — This colourful and solid *Chama* is usually a species easy to identify. Lamy (1921: 238-239; 1927: 325-326) cited E.A. SMITH (1885: 171) who stated that the margins of *C. brassica* always are smooth. Hidalgo (1903: 380) recognize the different figure of CLESSIN (1889: pl. 9, f. 1) as *C. brassica* too "como he tenido ocasion de observar comparando un ejemplar algo semejante de mi coleccion". Hidalgo also stated "el borde interno de las valvas liso". COOKE (1896: 96) erroneously placed *C. brassica* in the synonymy of *C. cornucopia* Reeve.

Lamy (1921: 239) identified as *C. brassica* several specimens from the Jousseume collection, labeled by this latter "C. chinensis Chemn.?" and collected off Djibouti. Lamy (1927: 326) gives the Jousseume-label as "C. chinensis Chenu (1846, Illustr. Conch., pl. V, f. 6-6a-b)". The figure 6 from CHENU is reproduced here: Possibly an old, eroded specimen, as seen on the other picture. The eroded

specimen on this picture is interesting, showing the furrow on the free valve: A constant mark of *C. brassica* and identification-help when specimens are badly eroded.

Literature records.

SMITH (1885: 171) Aden.

ANTHONY (1905: 492) Djibouti.

LAMY (1921: 238-329) Djibouti, Périm.

LAMY (1927: 325-326) Golfe de Tadjourah, Djibouti, Périm; Diego-Suarez (Madagascar).

COX (1931: 8) Zifaf Is., reef limestone (fossil).

FRANC (1956: 57) Ile Abulat: Cap Sud, 2m.

SELLI (1973: 214) G. d'Aden (Gibuti, Perim); (fossil).

MASTALLER (1979: 149) cited only localities from earlier authors.

Material in collections.

- HUJ : 35764 Elat (P. Goldschmidt, 1971: 1 eroded valve).  
35786 Red Sea (ex. coll. Coen, 11472: gem specimen, 57 x 47 mm / 48 x 48 mm). Because of the extremely different form we represent this specimen too.
- MNHN : Djibouti (Jousseume). Ile Abulat (Miss. Cherbonnier, "Calypso" = FRANC, 1956: 57-figured on plate III, fig. 8).  
— alcohol coll.: Djibouti (Miss. Gravier: clumb of 3 juveniles, another juvenile and 2 spec. pink coloured).
- RNH : Gemsa, G. Suez, Egypt (F. Heybroeck coll., 1948: 1 specimen, reg. 779).

***Chama brassica elatensis* nov. subsp.**

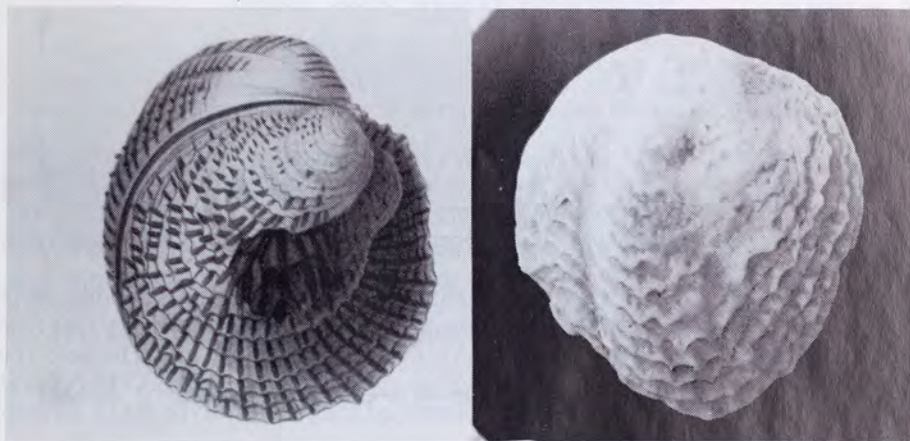
Description. — The general form of *C. brassica* nov. subsp. is triangular, even squarely in an exceptional specimen as it is shown on plate III, fig. 4. The scales on the free valve are more squamous, not individually separated. Exterior of the valves brightly coloured with yellow and orange-red. Margins inside obviously crenulated. Interior of the valves white, the crenulated margins in the same colour, orange-red of the outside of the valves.

Habitat. — On corals and rocks; 2-6 m.

Type material.

- Holotype: 63 x 45 mm. Eilat South (Peled, 3-1979). In coll. Peled. Figured: Pl. III, fig. 5.
- Paratype 1: 64 x 56 mm. Sharm el Sheick (Peled, 1977: 2-4 m, coral). In coll. Peled. Figured: Pl. III, fig. 1.
- Paratype 2: 37 x 27 mm. Eilat South. In coll. author: Ch. 28.
- Paratype 3: 68 x 53 / 57 x 65 mm. Eilat (Rapoport). In coll. Haviland. Figured: Pl. III, fig. 4.
- Paratype 4: 64 x 62 mm. Eilat (Rapoport). In coll. Haviland. Figured: Pl. III, fig. 2.
- Paratype 5: 29 x 25 / 25 x 30 mm. Eilat South (Peled, 1979: on coral). In coll. author: Ch. 23.
- Paratype 6: 64 x 56 mm. Sharm el Sheick. In coll. Haviland. Figured: Pl. III, fig. 6.
- Type locality. — Eilat South, Gulf of Aqaba.

Remarks. — Compared with the typical *C. brassica* (REEVE, 1847), well known from the Philippines, the new subspecies is a light-weight *Chama*, with a squamous exterior of the two valves, although some specimens of *C. brassica* Reeve, in coll.

CHENU (pl. V, fig. 6): *C. chinensis*Eroded *C. brassica*, loc.: Andamans.  
Coll. author.

author (loc.: Solomon Islands) approximate this character very much. The most characteristic feature of the new subspecies are the crenulated margins, as opposed to the always smooth margins of *C. brassica* Reeve. The smooth margins of *C. brassica* Reeve were already stated by Smith (1885: 171), Hidalgo (1903: 380) and Lamy (1927: 326). Specimens with crenulated margins (and adults!) of *C. brassica* were not seen before by the present author, with exception of the specimens from the Gulf of Aqaba. Mr. Peled (specialist in Red Sea molluscs) and Mr. Haviland, both were convinced that these Red Sea-specimens belong to an undescribed species. But by way of precaution it is preferred here to regard it only as a new subspecies. Colour-pictures sent by Mr. Rapoport (Israel) represent also specimens of the new subspecies.

The subspecific name *elatensis* refers to the type locality. All specimens of *C. brassica elatensis* are collected in the Gulf of Aqaba, a distribution separated from the distribution of *C. brassica* Reeve which is limited to the south of the Red Sea.

### *Chama broderipi* Reeve, 1846.

#### Literature records.

- TILLIER & BAVAY (1905: 117): Seuil de Chalouf; Petit Lac Amer; Seuil de Serapeum; Lac Timsah.  
GRUVEL & MOAZZO (1933: 145): *C. broderipi* (?), Grand Lac Amer - rare.  
MOAZZO (1939: 71): Plage de Port-Fouad - rejeté.

Remarks. — We have not studied the material mentioned by these authors. Probably they confused it with a form of *C. asperella*. *C. broderipi* (= *C. pacifica* Broderip, 1834) is never seen between the multitude of *Chama*-specimens from the Bitter Lakes (f.i. Beets collection in RNH). The material of these records in the literature must be re-examined.  
MASTALLER (1979: 149) included these records in the synonymy of *C. asperella*.

**Pseudochama corbieri** (Jonas, 1846).

*Chama gryphoides* Audouin (not Linné), 1827. Descr. Egypte, XXII: 218.

*Chama corbieri* Jonas, 1846 (aug.). Zeitschr. Malakoz., III: 126.

*Chama cornucopia* Reeve, 1846 (dec.). Conch. Icon., IV: pl. IV, spec. 22.

*Chama ruppelli* Reeve, 1847. Conch. Icon., IV: pl. VI, spec. 30.

Original description. — "Chama testa sinistrorsa, suborbiculari, crassa, alba, opaca, nate prominente affixa, lamellis, transversis, confusis, appressis, radiatim plicatis rugosa; valva inferiore turgida, profunda, superiore minore convexa, umbone minimo; intus nitida, alba, limbo & cardine purpurea, dente & fossula serratis, margine crenulato." JONAS.

Type material. — The two types, mentioned by Jonas in his description, were collected by Savigny during Napoleon's Egyptian Campaign (1798 - 1801). One type specimen is reproduced in the famous SAVIGNY (1817: pl. XIV, f. 8). The lectotype hereby designated, measures 37 mm. It is the specimen figured in SAVIGNY and shown on our plate IV, fig. 2. The lectotype and the paralectotype are in MNHN (in the Savigny collection).

Type locality. — Suez.

Distribution. — Red Sea and the Gulfs of Aqaba and Suez (many records). Possibly the extension is wider, but we cannot confirm this.

Discussion. — In his description of *Chama* (= *Pseudochama*) *ruppelli*, Reeve noted already that this species was "approximating closely to the *C. iostoma*, but from so remote a locality" that he was convinced this was a new species. Type locality of *C. iostoma* Reeve: "Sandwich Is." VAILLANT (1865: 21) indicated *Chama iostoma* Reeve to be conspecific with *Chama* (= *Pseudochama*) *corbieri*.

ISSEL (1869: 78) placed *Chama* (= *Pseudochama*) *cornucopia* in the synonymy with *Chama* (= *Pseudochama*) *corbieri* and FISCHER (1870: 170) added to the synonymy *Chama* (= *Pseudochama*) *ruppelli* - this was also the opinion of VON MARTENS (1880: 323).

It must be said that before FISCHER already PAGENSTECHER (1877: 39) was convinced of the synonymy of *Chama* (= *Pseudochama*) *cornucopia* and *Chama* (= *Pseudochama*) *ruppelli* with *Chama* (= *Pseudochama*) *corbieri*, but this author erroneously placed in the synonymy of *C. iostoma* also *C. claasseni* Jonas and *C. meyeri* Jonas (in fact being forms of *C. reflexa* Reeve = *C. pacifica* Broderip).

BUCQUOY-DAUTZENBERG-DOLLFUS (1892: 210) identified with the figure in SAVIGNY (pl. XIV, f. 8) the *Chama* (= *Pseudochama*) *ruppelli*. STURANY (1901: 283) gives *Chama* (= *Pseudochama*) *cornucopia* = *Chama* (= *Pseudochama*) *ruppelli*.

From Red Sea authors can be cited also NEWTON (1906: 556), noting the synonymy of *C. cornucopia* with *C. corbieri*, and TOMLIN (1927: 305) who stated the synonymy of *C. ruppelli* with *C. cornucopia* (all types of *Pseudochama*&). An inaccurate author was COOKE (1886: 96) who placed in the synonymy of *Chama* (= *Pseudochama*) *cornucopia*: *C. foliacea* Q. & G., *C. reflexa* Reeve and *Chama* (= *Pseudochama*) *ruppelli* Reeve, all sensu M'ANDREW (1870), but also *C. nivalis* Reeve, *C. brassica* Reeve and *C. rubea* Reeve!

Lamarck divided the CHAMIDAE into *sinistrorse* species (= *Pseudochama*) and *dextrorse* species (= *Chama*), growing counterclockwise and clockwise resp.



Lamy (1921: 310; 1927: 371-373) identified *C. corbierei* = *C. ruppelli* = *C. cornucopia* as *sinistrorse* species (= *Pseudochama*), counterpart of *C. limbula* = *C. iostoma*, the *dextrorse* species (= *Chama*).

At last, PALLARY (1926: 125) added to the synonymy of *Chama corbierei* (= *Pseudochama corbierei*) also *C. gryphoides* (sensu Audouin, 1827), being a misidentification of SAVIGNY (pl. XIV, f. 8) with *C. gryphoides* Linné.

We mention all these authors and publications, because of their importance in Red Sea malacology. We studied the types of *Pseudochama cornucopia* (Reeve) (lectotype hereby designated: the type specimen measurements 60 x 50 mm; paralectotype 60 x 43 mm; both in BMNH) and *Pseudochama ruppelli* (Reeve) (holotype 44 x 38 mm in BMNH): They are without any doubt conspecific with *Pseudochama corbierei* (Jonas). It is a species without an exterior sculpture (mostly eroded) but easily to identify by the smooth margins with a touch of purple. The smooth margins are a distinguishing mark in comparison with *Pseudochama ruderalis* (Lamarck, 1819) with crenulated margins. We bring together all the literature records under their (original) synonymous names.

Literature records.

- *corbierei*

VAILLANT (1865: 21) 62. Rade de Suez (très abondante); Euzoug Katah el Kébir (sur les récifs de polypiers). Fig SAVIGNY.

FISCHER (1865: 244) Suez.

ISSEL (1869: 78) 89. Golfo d' Akaba; Suez; fig. SAVIGNY.

FISCHER (1870: 170) 60. Suez; Mer Rouge.

PAGENSTECHE (1877: 39) 25.

KOBELT (1887: 131) Suezkanal.

CARAMAGNA (1888: 138) Assab, sui banchi e scogliere emerse a bassa marea.

JOUSSEAUME (1888: 210) 168. Obock; Ile Camaran (plusieurs individus recueillis vivants).

LAMY (1921: 309) Suez.

LAMY (1927: 373) Suez (Joussemaume collection).

PALLARY (1926: 125) Fig. ex SAVIGNY (pl. XIV, f. 8).

PALLARY (1932: 318).

MOAZZO (1928: 71) Baie de Suez (commune); Sud des Fontaines de Moise; Kalah el-Kebira; Ras Sudr; gare de Kabret; Canal.

BOUCHET & DANRIGAL (1982: 12) Fig. ex SAVIGNY (pl. XIV, f. 8).

- *cornucopia*

REEVE (1846: spec. 22) Red Sea.

M'ANDREW (1870: 447) (reefs, frequent).

COOKE (1886: 96 - ex M'ANDREW, 1870).

HART (1891: 193) Gulf of Akaba; 'Ayūn Mūsa, Gulf of Suez.

NEWTON (1900: 566) Gharib Lighthouse (raised beach 20 feet above sea and recent beach - fossil).

HALL & STANDEL (1907: 68) Port Sudan (raised coral reef).

TOMLIN (1927: 305) Gulf of Suez.

HOTTINGER (1972: 6, figs. 1-7) Tidal flat between inner and outer lagoon of El Kura Bay, Dahab, Gulf of Eilat.

BARASH & DANIN (1972: 338) Yafo (1963 - 1 shell from the beach; det. Rosewater).

MASTALLER (1979: 149, 240, tab. 12) Aqaba (riffplattform, abrasionsfels und *Sargassum*-Hortzone, assoziiert mit *Phytil* und auf erodiertes Karrenfels).

- *ruppelli*

REEVE (1847: spec. 30) Red Sea (Rüppell).

ISSEL (1869: 78) (loc. = loc. *C. corbierei*?).

M'ANDREX (1870: 447) Red Sea (shallow water, common).

COOKE (1886: 96 -ex M'ANDREW, 1870).

CARAMAGNA (1888: 138) Assab.

STURANY (1899: 283) 67. Senafir; Shadwan; Pt. Berenice.

STURANY (1905: 139) Masaua (Jickeli; Levander); Dahlak (Jickeli).

ANTHONY (1905: 439) Djibouti.

TILLIER & BAVAY (1905: 177) Seuil de Chalouf; Petit Lac Amer.

HEINRICH (1923: 73) El Tor (Strand der Westl. Korallenküste); Scherm el Moye (Strand nahe der gleichnamigen Süßenwasserstelle).

KLAUSENWITZ (1967: 52) Sarso Is. (abrasionsterrace).

## Material in collections.

KBIN : Dautz. coll., drawer 1571: Plage des Fontaines de Moïse, Suez (1893), 38 x 26 / 30 x 25 / 22 x 24 mm.

RNH : Beets coll., Ras Matarma, Gulf of Suez (1948-49, beach) - figured on our plate IV, fig. 4.  
Coll. Yaron : 1434 Sharm el Moya (1969, beach, 1 complete specimen); 4026/4027 Abu Zhieme (1969, beach, 1 attached valve, 1 free valve).

Coll. De Brauwer: Hurghada (De Brauwer, 1980: 1 complete specimen). - In his list of species collected off Hurghada (Egypt) this author mentioned: 179. *C. limbula*. The specimen (figured on his pl. 8, f. 179) is not *C. limbula* but *Pseudochama corbierei*. The late H. De Brauwer was a beloved member of the Belgian Society for Conchology († 1983).

Remark: Lamy (1927: 372) mentioned in foot-note five specimens, labeled by Vaillant "*C. iostoma* Conr. = *corbierei* Jon." - kept in MNHN. Only one is *Pseudochama corbierei*. Two specimens are identified by Lamy as *C. reflexa* Reeve, the other two as *C. asperella* Lamarck!

***Pseudochama corrugata* (Broderip, 1834).**

*Chama corrugata* Broderip, 1834 (9 dec.). P.Z.S.: 150.

*Chama corrugata* Broderip, 1834 (23 dec.). Trans. Zool. Soc., I: 305, Tab. XXXVIII, fig. 7.

Original description. — "*Chama testa corrugata, rubro-purpurea albo varia; intus atro-purpurea, limbo integro.*" BRODERIP.

Type material. — The type specimen, figured in BRODERIP, is not located.

Type locality. — By original designation: "In America Centrali. (Real Lleijs.) Found attached to stones at low water; Cuming."

## Literature record.

HART (1891: 195): Ain Musa, G. Suez.

Remark. — It must be a misidentification because *Pseudochama corrugata* (Broderip) is a Pacific, Central American Species; most common *Pseudochama*-species reported in the Panamic province and ranges from southern Mexico to Peru. The purple interior of the shell is a guiding feature for identification.

Probably Hart (1891) confused Red Sea-specimens of *Pseudochama corbierei* with the Western American *P. corrugata*, misguided by the purple interior.

**Chama fibula** Reeve, 1846.

*C. fibula* Reeve, 1846. Conch. Icon., IV: pl. V, spec. 27.

*C. hendersoni* (?) Dall, Bartsch & Rehder, 1938.

Original description. — "Cham. testa orbiculari, valva superiore squamis brevibus lamellatis concentricis confertissime exsculpta, inferiore squamis paucioribus, elongatis, plano-appressis, crenulatis; nivea, ferrugineo-fusco interdum pallide tincta, umbonibus peculiariter violaceis; intus alba, ab umbonibus violaceo-purpureo radiata." REEVE.

Type material. — A cluster of 4 syntypes is kept in BMNH.

Type locality. — By original designation: "Island of Luzon, Philippines (attached to coral); Cuming."

Discussion. — Smith (1885: 172) was convinced that *C. fibula* and *C. asperella* Lamarck are conspecific. No opinion in LAMY (1927: 361). Hidalgo (1903: 378) recognize the species of REEVE with type locality in the Philippines; but with a question-mark on CLESSIN (1889: pl. XX, -4, *G. fibula*). HEDLEY (1916) recorded the species from Sydney Harbour, New South Wales (Australia).

Study of the syntypes in BMNH did not clear up the problem. The valves have "minutely crenulated margins", the free valves somewhat bulging. In coll. author several specimens from the Philippines, even as from Western Australia, are resembling the syntypes, but nearly each specimen is different in colour and sculpture.

E.A. KAY (1979: 540, fig. 175) stated that *C. hendersoni* D.B.R., 1938 is a synonym of *C. fibula* and that the species, recorded from Pearl Harbor and Honolulu Harbor (Oahu), is "very common in beach drift at Midway". We recognize the attached valve in KAY (fig. 175) as resembling specimens in KBIN (Dautz. coll.), labeled *C. fibula*.

Provisionally we consider *C. fibula* Reeve to be a valid species, distinguished by the crenulated margins from *C. aspersa* f.i.

## Literature record.

MALTZAN (1871: 203) Suez.

Remark. — We could not study the material mentioned in MALTZAN, but we think to recognize *C. fibula* in some eroded specimens from the Gulf of Aqaba (HUJ). It is possible that also this Indo-Pacific species is living in the Red Sea.

**Pseudochama fimbriata** (Reeve, 1847).

*Chama fimbriata* Reeve (not Defrance), 1847. Conch. Icon., IV: pl. VIII; spec. 41.

Original description. — "Cham. testa suborbiculari, valvis ambabus concentricis fimbriato-lamellatis, valvarum marginibus minute crenulatis; lutescente-alba." REEVE.

Type material. — Holotype in BMNH, measurements 26 x 31 mm.

Type locality. — By original designation: "Point Cunningham, North Australia; Dring."

Discussion. — *Chama fimbriata* Reeve, 1847 is a junior and primary homonym of *Chama fimbriata* DeFrance, 1818 - ICZN (1985: 57 b), thus not a valid name. *Chama fimbriata* DeFrance (1818 - suppl.: 65) - is a fossil species.

In his monograph Reeve did not mention *Pseudochama ruderalis* (Lamarck, 1819), nor the "var. b", distinguished by Lamarck. After examination of the types of *Pseudochama fimbriata* (Reeve) and *Pseudochama ruderalis* (Lamarck), we are convinced they are conspecific. *Chama fimbriata* Reeve consequently is also a junior synonym.

We list the literature records of "*Chama fimbriata* Reeve" and the examined material under *Pseudochama ruderalis rianae* nov. subsp. from the Red Sea.

### *Chama foliacea* Quoy & Gaimard, 1835.

*C. foliacea* Quoy & Gaimard, 1835. Voy. Astrol. Zool.: 478; pl. 78, fig. 19.

Original description. — "Chama testa elongato-ovali, subtriquetra, imbricata, croceo-rubente, intus albo-violacea; lamellis obliquis canaliculatis." QUOY & GAIMARD.

Type material. — The type specimen must be considered as "not located". We select hereby as lectotype the specimen figured by Quoy & Gaimard (1835: pl. 78, fig. 19), represented below.

#### Literature records.

M'ANDREW (1870: 447) Reefs; rare.

COOKE (1886: 96) ex M'ANDREW (1870: 447).

Discussion. — The type figure is difficult to interpret. On the free valve rows of yellow tubular scales are represented between the two purple zones (in the coloured edition of Quoy & Gaimard). The opinions of earlier authors (f.i. Hidalgo, 1903: 374; Lamy, 1927: 327-329) confirm our view that *Ch. foliacea* Q. & G. is an unusual form of *C. pacifica* Broderip.

Cooke (1886: 96) believed that MacAndrew's record referred to *Pseudochama cornucopia* (= *P. corbierei*). Lamy (1921: 239) considered the species to be analogous to *C. reflexa*. Morch, in a handwritten catalog of Forsskal's collection (in ZMU) placed the species in the synonymy of *C. claasseni* Jonas (information by dr. Yaron in manuscript: MORCH, 1846-53: N° 108). However, *C. reflexa* Reeve and *C. claasseni* Jonas are conspecific with *C. pacifica* Broderip.

The figured *C. foliacea* Q. & G. in REEVE (1846: pl. II, f. 8) is quite different from the type figure by Q. & G. A specimen from the Philippines, resembling REEVE's figure, is kept in KBIN (Dautz, coll., drawer 1572). One Red Sea-specimen, collected by Hénou (loc.: Suez), identified *C. foliacea* Q. & G., is kept in KBIN (Dautz. coll., drawer 1572, IG 10591). The measurements of this specimen are 55 x 37 / 45 x 38 mm and it is represented below, clearly conspecific with *C. pacifica*.

### *Chama fragum* Reeve, 1846.

*C. fragum* Reeve, 1846. P.Z.S.: 117.

*C. fragum* Reeve, 1847. Conch. Icon., IV: pl. IX, spec. 48.

Original description. — "Cham. testa suborbiculari, valva superiore concentricè tenuissime fimbriato-laminata, lamina marginem versus subtubulosis, inferiore rude tubuloso-squamata, valvarum marginibus minute crenulatis; alba, rufo-punctata, intus albida." REEVE.

Type material. — The specimen described by Reeve is not present in the type collection of BMNH and must be cited as "not located". We select hereby as lectotype the specimen figured by Reeve (1847: pl. IX, fig. 48).

Type locality. — By original designation: "Island of Mindoro, Philippines (attached to coral); Cuming".

Distribution. — Material is known from the Red Sea, Persian Gulf, the China coast (QIQIAN, 1984: 198) and the Philippines.

Discussion. — Specimens in RNH were the key to understand this species: One specimen from Karachi (by G.B. Sowerby, 1896), one specimen from Karachi (ex. coll. J. Mulder) - both figured on our plate V, fig. 6 - and a specimen from the Persian Gulf (the associated box is labeled "Sow. & Fulton, 1914"). The characteristic marks of *C. fragum* are: free valve concentrically fimbriated with tubular scales to the margin; lower valve rudely tubulously squamate: the margins crenulated. During a long time we were misguided by the identification of Lamy: On plate V, fig. 4, a specimen is represented from the Red Sea, identified by Lamy *C. fragum* (= *C. aspersa*), kept in MNHN. Lamy was also convinced that *C. douvillei* Jousseaume was only a var. of *C. fragum*, although the serious differences.

Specimens collected in the Persian Gulf and identified by TADJALLI-POUR (1974: 167, pl. XXIII, fig. 7-8) *C. macrophylla* Gmelin, 1792, represent the *C. douvillei* Jousseaume. The specimen *C. douvillei* from the Jousseaume collection (MNHN) is shown on our plate V, fig. 4. We take again the TADJALLI-POUR' information and the *C. douvillei* under *C. pacifica*.

TRYON (1872: 120) was convinced of the synonymy of *C. fragum* = *C. jukesi* = *C. pellis-phocae* = *C. spinosa* Brod. We stated already in our study in TURBINELLIDAE that Tryon made his opinion sometimes very intuitively. We are not agree with TRYON (1872: 120) but it is comprehensible as *C. fragum* seems to be a scaling-up of *C. asperella* (and the synonyms named by Tryon). Important are the tubulous scales in adult shells. *C. fragum* is correctly reproduced in CLESSIN (1889: pl. 10, fig. 2-3).

We recognize *C. fragum* Reeve in a beautiful specimen from Coll. Peled, represented on our plate V, fig. 3. QIQIAN (1984: 193), illustrates this valid species, living on China coasts.

#### Literature records

FISCHER (1870: 170, n° 61) Suez, très commune.

SHOPLAND (1902: 178) Aden.

STURANY (1905: 139) Massaua.

MELVILL & STANDEN (1906: 840) Persian Gulf.

LAMY (1921: 307) Périm; Aden.

LAMY (1927: 367-368) Périm; Aden; Kurachi.

LAMY (1938: 24) Golfe de Suez (several stations).

MASTALLER (1979: 150) cited only localities from earlier authors.

We list these authors with some reserve: If *C. fragum* is living abundantly in

G. Suez, why than the lack of material in collections? Concerning SHOPLAND (1902), his identifications were founded on Paetel's Catalog, as said by himself! Sturany identified specimens as *C. fragum*, collected by Jickely and Levander.

Material in collections.

- HUJ : 35761 Eilat (H. Steinitz, 1955: attached valve 25 x 18 mm)  
 TAU : Off Eilat (Leg. Ch. Lewinsohn, 1966: 34 - 44 fm. 2 attached valves. 22 - 25 fm. 1 free valve; 22 - 27 fm. 1 attached valve). Eilat (D. Zalcman, 1970, grab 270 m, Op. New Port).  
 Identification of this juvenile material with some reserve.  
 KBIN : Dautz. coll., drawer 1572: Aden (Fulton, 1895: 22 x 18 / 27 x 25 mm; IG 10591).  
 Coll. Peled : Eilat (Peled, 1983, 6 - 7 m, on coral rock 40 x 40 mm).

***Chama gryphoides* (Linné) Lamarck, 1819.**

- C. gryphoides* (pars) Linné, 1758. Syst. Nat., ed. X: 692.  
*C. gryphoides* L. Lamarck, 1819. An. s. Vert., VI: 94.  
*C. circinata* Monterosato, 1878. Conch. Medit., XIII: 71.  
*C. nicolloni* Dautzenberg, 1892. Bull. Soc. Sc. Nat. Ouest France, II: 133, f. 1-5.

The opening of the Suez Canal in 1869 made direct contact between the Mediterranean Sea and the Red Sea. A considerable number of Indo-Pacific species are collected in the Mediterranean Sea. We remember f.i. the recently found *Strombus decorus raybaudi*, which is locally common. (1).

Some Mediterranean species infiltrated into the Suez Canal. BARASH & DANIN (1972: 301-374) listed 45 Indo-Pacific species in the Mediterranean. In an appendix the authors reported on a collection of Mollusca from the Suez Canal. With all reserve we mention the records of *C. gryphoides*, a Mediterranean species (also Atlantic from Portugal to the Canaries).

Literature records.

- FORSSKAL (1775: XXXI, n° 32. *C. gryphoides* L. (?).  
 AUDOUIN (1827: 210) (= misidentification of SAVIGNY (pl. XIV, f. 8) = *P. corbieret*).  
 FISHER (1865: 264) Suez.  
 BLANFORD (1870: 470) N° 107. Annesley Bay.  
 SHOPLAND (1902: 178) Aden. (Identification founded on Paetel's Catalog!).  
 TOMLIN (1927: 305) Km. 64, T. 12; T.O; K. 9; K. 5; Km, 152: PT. Darse; PT. 7; R. 5; R. 6.  
 GRUVEL & MOAZZO (1933: 145) Grand Lac Amer, très commune.

Material in collections.

- TAU : Eilat (D. Zalcman, 1968, Grab, 121 m dept. Op. Old Port: subfossil, free valves of juveniles).  
 Coll. Yaron : Nuweibe el Muzeine (Yaron, 1982, live on rock in 0.50 m water). 2520 Coral Is. (Yaron, 1971, live on rock in 0.70 m water). 3973 Di-Zahav (Yaron, 1975, beach, 1 specimen).  
 All localities in the Gulf of Aqaba.

We refer to the discussion on DESHAYES (1835: 584) under *C. asperella* in this publication!

Morch in a handwritten catalog of Forsskal's collection (ZMU) placed *C. gryphoides* sensu Forsskal in the synonymy of *C. meyeri* Jonas (Information by prof. Yaron in manuscript).

- (1) Verhecken A., 1984. *Strombus decorus raybaudi* in de Middellandse Zee. Gloria Maris, vol. 23 (4).  
 De Roover R., 1985. Op jacht naar *Strombus decorus raybaudi*. Gloria Maris, vol. 24 (8): 205-207.  
 Steppe L., 1985. *Strombus decorus raybaudi* in de Middellandse Zee. Gloria Maris, vol. 24 (8): 209.

***Chama lazarus* Linné, 1758.**

- C. lazarus* Linné, 1758. Syst. Nat., X: 691, no. 129.  
*C. lazarus* Linné, 1764. Mus. Lud. Ulricae.: 513, no. 83.  
*C. damaecornis* Lamarck, 1819. An. s. Vert., VI: 93.  
*C. lizardensis* "Crosse", Kawamura Collection, 1983: pl. XLVI, f. 2.

Original description. — "C. testa imbricata lamellis laceris, nate oblique subspirali." Ref.: "Rumph. mus. t. 46. f. 3; Argenv. conch. t. 23. f.F.I.; Brown. jan. t. 40. f. 9."

To the same description and Ref. "Rumph. ..., Argenv. ..." LINNE (1764) added "Seb. Mus. 3. t. 89. f. 5, 6, 9, 11" and the following description: "Testa admodum squarrosa ex lamellis elevatis patentibus, imbricatis, laceris, longitudine testae colore albidis flavis aut rufis. Intus glabra; surotunda, concava; postice fornicata; altera productiore oblique fornicata, instar auris. Cardo constans callo obtuso, crenato intra fossam, qui inferitur alterius fossulae obliquae."

Type material. — *C. lazarus* Linné is represented in the Collection of the Linnean Society (London) by a single specimen associated with a "marked box", historically regarded as indicative of Linné's own collection. The shell itself is unmarked. The species is also represented by four specimens in ZMU, labeled "Museum Gustavi Adolphi", from the Mus. Mud. Ulricae.

It is possible that the specimens in ZMU were those to which Linné initially referred in comparison with the quoted figures, as the manuscript of Mus. Lud. Ulricae was already completed in 1753 (according to LOVEN, 1887). This would suggest that the specimens in ZMU could have precedence to be regarded as "probable syntypes."

However there is no doubt of the species meant by Linné and besides the quoted figures RUMPHIUS (1741: t. 48, f. 3) and d'ARGENVILLE (1742: t. 23, f. F) clearly represent the species. We only remark that d'ARGENVILLE (1742: t. 23, f. I) don't represent *C. lazarus*, but a *Spondylus* - species.

Type locality. — The localities "M. Mediterraneo, Americo" given by Linné are erroneous. With regards to *C. damaecornis* (= *C. lazarus* Linné) Lamarck (1819) mentioned "l'Océan des Grandes-Indes". This is correct as *C. lazarus* Linné (not Lamarck) is living in the Indian Ocean, and especially in the Philippines.

Distribution. — Broad Indo-Pacific, abundant in the Philippines. In the coll. author specimens are kept from the Solomon Is., In MNHN from Nouvelle Calédonie f.i.; QIQIAN (1984) mentioned the species from the China coast, Hainan Is. Also found living in the Red Sea and the Gulfs of Aqaba and Suez.

Habitat. — Cemented on corals, wrecks, other shells as Oysters even on other species of CHAMIDAE (coll. author).

Discussion. — *Chama lazarus* Linné, the type species of the genus *Chama*, is the best known species of the CHAMIDAE in the world. Identification is no problem. Although most of the specimens are white with two rays of violet-pink from the umbones, this species exists in different colours: In the own collection specimens are completely lemon-coloured, or with violet, violet-brown or white foliations; or the valves completely bright orange, lightly brown, rust-brown... Juveniles have always the most beautiful colours. Very young specimens (less than 20 mm) are sometimes unrecognizable for beginners because they have only a few concentric scales, for lack of the foliation. In a publication on the Kawamura Collection (1983)

we found "*Chama lizardensis* Crosse - Red Sea": Without any doubt this is a lemon-coloured juvenile of *C. lazarus* Linné and thus synonym. We didn't find any information in CROSSE concerning the name *C. lizardensis*.

With regards to the synonymy of *C. damaecornis* Lamarck with *C. lazarus* Linné, already stated by DESHAYES (1835: 580), HANLEY (1855: 89) and LAMY (1917: 201-202; 1927: 305-308): After examination of the two syntypes in MHNG (Collection Lamarck, N° 2, 1086/97: 73 x 74 mm and 71 x 56 mm, loc.: Oc. Indien) and two specimens in MNHN (labeled by Lamarck "*Chama damaecornis*", 45 mm; 70 mm) there is no doubt that *C. damaecornis* Lamarck is a junior synonym of *C. lazarus* Linné.

The homonym *C. lazarus* Lamarck, 1819 is an incomprehensible confusion by Lamarck being a junior synonym for *C. macerophylla* Gmelin, 1791 (ref.: CHEMN., 1784: pl. III, figs. 514-515). See discussion under *C. imbricata* Brod. = *C. plinthota* Cox.

About the examined specimens found in the Red Sea: Although most of them were eroded, other specimens without any doubt were live taken. In the private collection of D. Peled for instance, beautiful juveniles are kept, according with *C. lizardensis* "Crosse" from the Kawamura collection.

#### Literature records.

FORSSKAL (1775: XXXI, N° 31).

BROCCHI (1821: 83).

LAMY (1921: 236-237) Suez; Obock; Aden; Djibouti - "Ce n'est que dans cette dernière localité que j'ai trouvé cette espèce vivante..." JOUSSEAUME.

LAMY (1927: 308) - idem.

COX (1931: 8) Zifaf Is., reef limestone; Ras Hassis, Farsin Kebir, raised beach (fossil).

FRANC (1956: 58) Ile Abulat (subfossil).

SELLI (1973: 212) "È interessante notare che questa specie è nota fossile nelle scogliere emerse del M. Rosso da Suez al Golfo d' Aden, mentre oggidi vive solo al margine S di questo mare (Assab, Gibuti)..."

MASTALLER (1978: 139) Port Sudan.

MASTALLER (1979: 150) Dungonab.

SHARABATI (1984: pl. 46, f. 3 a-c).

Remark by dr. I. Yaron. — "Forsskal's record is not accompanied by a locality, but as he cited the Greek and the Arabic vernacular names, it is possible that he referred to a Mediterranean species. Forsskal's record was cited among others by CHEMNITZ (1784: 141, tab. 51, figs. 507-509), but the specimen figured by him came from Moltke's collection and was obtained in the East Indies. In a handwritten catalog of Forsskal's collection in the Zoological Museum of the University of Copenhagen (1846-53), Morch placed *lazarus* and *gryphoides* sensu Forsskal in the synonymy of *meyeri* Jonas. Brocchi (1821: 83) was not certain about the identification, and stated that this record could also be referred to *gryphoides*.

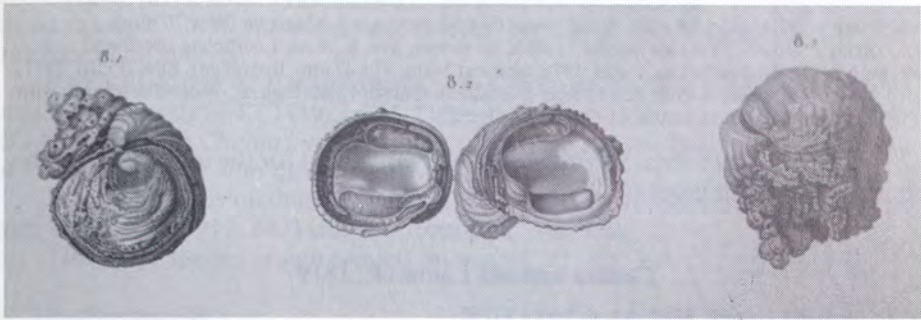
MASTALLER (1979: 150) remarked, that this was the first specimen collected alive, while all the previous ones were fossil of subfossil ones." (Manuscript)

#### Material in collections.

MNHN : Ile Abulat (Miss. Cherbonnier: subfossil). Djibouti (jousseume: 82 mm).

TAU : Eilat (D. Zalcman, 1968, Grab, 121 m, Op. Old Port; 1970, Grab. 270 m, Op New Port) - nepionic shells, identif. author.





SAVIGNY (pl. XIV, fig. 8): *Pseudochama corbierei* (Jonas).



QIQIAN (1984: 193): *Chama fragum* on China coasts.



Lectotype *C. foliacea* Q. & G., 1835:  
 QUOY & GAIMARD (1835: pl. 78, fig. 19).  
 Several interpretations are given on *C. foliacea* Q. & G. - see also on p. 113.

"*C. foliacea* Q. & G." = *C. pacifica*.  
 Suez (Hénou). KBIN: IG 10591 (55 x 38 mm).

- Coll. Peled : Eilat (92 x 88 mm; 79 x 75 mm; 87 x 92 mm; o.a.). Massawa (84 x 70 mm).  
 Coll. Yaron : Eilat - "Vernice lagoon" (1980, on stones, live, 0,50 m: 1 complete specimen).  
 Coll. author : Eilat South (Leg. Peled, 1976, on coral 2-4 m: 47 x 47 mm, live taken). Eilat (Peled, 1977, on coral, 4 - 6 m: 75 x 63 mm, live taken). Gulf of Eilat (Don. E. Wils: 90 x 95 mm; with the attached valve of *C. pacifica* Brod.).

We are grateful to Ms. S. Morris (BMNH - Bivalves) for the information concerning the possible types of *C. lazarus*.

### ***Chama limbula* Lamarck, 1819**

- C. limbula* Lamarck, 1819. An. s. Vert., VI: 95.  
*C. iostoma* Conrad, 1837. Journ. Acad. Nat. Sc. Philad., VII: 256.  
*C. nivalis* Reeve, 1846. Conch. Icon., IV: pl. IV, spec. 17.  
*C. bülowiana* Clessin, 1889. Conch. Cab.: 34, pl. 15, f. 1-2.  
*C. porosa* Clessin, 1889. Conch. cab.: 45, pl. 18, f. 1-2.  
*C. limbata* Paetel, 1889. Catalog: 122.

Original description. — "Ch. testa semi-orbiculari, oblique fixa, submutica, crassa limbo interno violacea. (b) Var. valva minore gibba." LAMARCK.

Type material. — Five syntypes are in MNHN, labeled "Individus nommés par Lamarck". Measurements ranging from 45 x 30 mm to 32 x 20 mm. They are represented on our plate VI, fig. 3. An other specimen (35 x 25 mm) is labeled "Chama limbula var. (b)", from another locality, but not enough different from the other syntypes to distinguish it from the species.

Type locality. — "Nouvelle-Hollande (Péron & Lesueur, 1803)." For the type specimen labeled "var. (b)": "Ile de France (Mathieu)" = Mauritius.

Distribution. — Broad Indo-Pacific (in coll. author: W. Australia, N. Caledonia,...). Well known from the Red Sea and the Gulfs of Aqaba and Suez.

Discussion. — Again an easely to recognize species in this family, because of the quiet permanent characters. Few specimens are an exception on the rule that the free valve is without any sculpture on the outside (by erosion). Simple distinguishing marks are the smooth margins which are purple coloured. In young gem specimens two groups of white scales are on the free valve, a furrow between. The species can grow up to giants as f.i. the specimen in SMF (Reg. 176769): 79 x 62 x 46 / 58 x 62 x 33 mm.

It must said that the figures in CHENU (pl. VII, f. 5-6) resemble not at all the syntypes of Lamarck. There is no doubt about the synonymy of *C. iostoma* Conrad with *C. limbula* Lamarck. ANTHONY (1906: 493) identified material from the Gulf of Tadjourah with *C. iostoma* (= *C. limbula*). CLESSIN (1889: 34, pl. 15, f. 1-2) distinguished a Red Sea-specimen, labeled "iostoma Rve" from the Bülow collection as a new species *C. bülowiana*. But this is only a form with the attached valve well developed. LAMY (1917: 207; 1927: 371) identified *C. porosa* Clessin, 1889 (again established on a Red Sea-specimen) also with *C. limbula*.

Hanley (1843: 229) noted the possible synonymy of *C. iostoma* with *C. imbricata* Broderip, but with two question-marks as he was not convinced. These two species are easely to distinguish from each other (as indicated under *C. imbricata* = *C. plinthota* Cox).

Reeve (1846: pl. II, spec. 7) identified *C. producta* Broderip as an "enormously produced example" of *C. iostoma*, - not correct, besides *C. producta* is a Pacific Central American species.

PAETEL (1889: 122) mentioned *C. limbata* Lamarck, a misspelling for *C. limbula*. And recently SELLI (1973: 215-216) mixed *Pseudochama corbierei* Jonas and its synonyms with *Chama limbula* and its synonyms, Maybe Selli followed the view of COX (1931: 12) who meant they were all conspecific.

At last, by study on the syntypes of *C. nivalis* Reeve (kept in BMNH), we agree with HEDLEY (1917: 683) this is a form of *C. limbula*.

This valid species is represented on our pl. VI, fig. 3-4.

#### Literature records.

BLANFORD (1870: 470) *C. iostoma*: Annesley Bay.

MART (1891: 195) *C. iostoma*: Ain Musa, Gulf of Suez.

NEWTON (1900: 556) *C. nivalis*: Gharib Lighthouse (beach east of and recent beach south of); Gem-sah (50 foot beach) Jebel Esh (raised beach east of); Wadi Gueh west of Kosseir (raised beaches 80 and 520 feet above sea). - all fossil.

ANTHONY (1905: 402) *C. iostoma*: Gulf of Tadjourah.

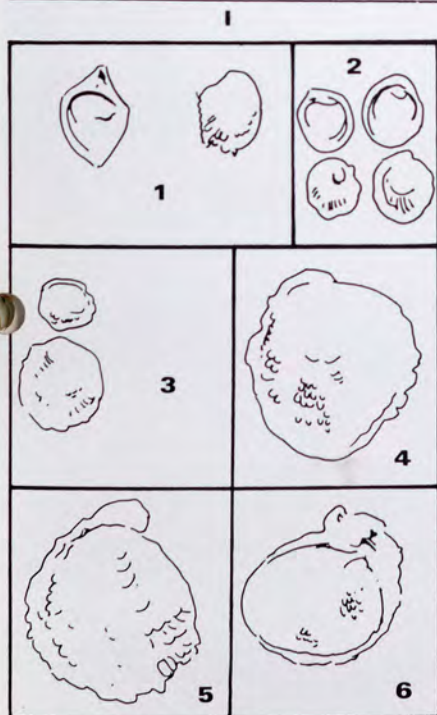
LAMY (1921: 308) *C. limbula*: Suez; Massaouah; Obock; Aden.

LAMY (1927: 371) *C. limbula*: (idem); Golfe de Tadjourah (Ch. Gravier, 1904).

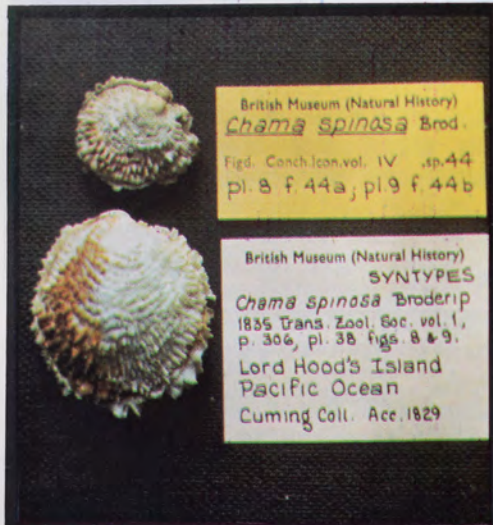
COX (1931: 8) *C. limbula*: Ras Hassis, Farsan Island, raised beach. - fossil.

LAMY (1938: 24) *C. limbula*: Sénafir.

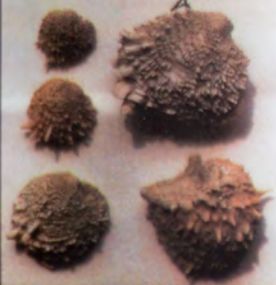
FRANC (1956: 58) *C. limbula*: Cap Sud; Îlot Ouest, par 1 - 3 m.



1. **Chama asperella** Lamarck.  
Lectotype. - MNHN (15 mm).  
"les mers australes".
2. **Chama asperella** Lamarck.  
Syntypes of *C. pellis-phocae* Reeve - BMNH.  
Island of Ticao, Philippines (Cuming).  
Fig. in REEVE (1847: pl. IX, 54).
3. **Chama asperella** Lamarck  
Syntypes of *C. spinosa* Broderip  
- BMNH (22 x 23,5 mm; 39 x 35 mm).  
Lord Hood's Island, Pacific Oc. (Cuming).  
Fig. in BRODERIP (1834 b: pl. 38, f. 8-9)  
and in REEVE (1847: pl. VIII, 44).
4. **Chama pacifica** Broderip.  
Lectotype of *C. reflexa* Reeve - BMNH.  
Darney Is., N. Australia (Jukes).  
Fig. in REEVE (1846: pl. IV, 16).
5. **Chama pacifica** Broderip.  
Holotype of *C. broderipi* Reeve  
- BMNH (90 x 65 mm).  
Lord Hood's Island, Pacific Oc. (Cuming).  
Fig. in REEVE (1846: pl. I, 2).
6. **Chama aeruginosa** Lamarck.  
Holotype. - MNHN (∅ 35 mm).  
Timor (Péron, 1803).



Muss. Pottgus Lamy 1938 p. 26  
*Chama asperella* Lh  
ex Bayad



*Chama asperella* Lh  
var: Juhesi Rve  
Golfe de Tadjourah  
Det: Lamy



*Chama asperella*  
var: unicoloris Brug  
Det: Lamy



D: F. Jousbeaume 1917 Lamy p. 54  
*Chama asperella* Lh  
var: unicoloris Brug  
Det: Lamy



*Chama asperella*  
Coll. C. Beets Reg 770  
Ras Gharib  
Golf van Suez



D: F. Jousbeaume 1917 Lamy p. 364

*Chama aspersa* Rve

Djibouti  
Det: Lamy

D: Jousbeaume 1917  
*Chama aspersa* Rve



FISHELSON (1971: 126) *C. limbula*: Dahlak (Infratidal rocks).

MASTALLER (1979: 150) *C. limbula*: Repeated only earlier authors.

SHARABATI (1984: pl. 46, f. 2. 201) *C. ruppelli*.

Material in collections.

- HUJ : 35760 Sharm el Sheick. 35767 Dahab (A. Nevo, 1956). 35770 Elat (J. Wahrman, 1949), 35771 Abu Zabab (1957). 35774 Aqaba (G. Haas, 1949). 35778 Elat, Coral Beach (Plattner, 1976).
- KBIN : Dautz. coll., drawer 1574 - *nivalis*: Suez (Bendall, 1886).
- MNHN : Ile Abulat (Miss. Cherbonnier. = FRANC, 1956: 58 Cap Sud, 3 ex.; Ilôt Ouest, 1 ex.). Djibouti (Miss. Gravier, 1904) reproduced on our plate VI, f. 2.
- RNH : 4 giant specimens, "Roode Zee" (Ruysenaers, -*limbata*).
- SMF : 168516 Ghardaga (A. Zilch, 1962). 168522 Al-Ghardaga (A. Zilch, 1962). 176769 Ghardaga (4 giant specimens of which one with the measurements 80 x 62 x 55 / 58 x 59 x 21 mm !). 168503 Rotes Meer (E. Rüppell! Labeled: "Ist die von Clessin - M. Ch.: 34 als *Chama bülowiana* beschreidenen Form").
- ZMA : Rode Zee (ex Van Heuckelom collection). Saoedi Arabië, bij Jeddah (Mrs. Williams, 1968: op koraal, ondiep water). Aden (prof. de Beaufort, 1938).
- Coll. Yaron : 1369 Ras Muhammed (1969: beach, 1 spec.). 1428 Sharm el Moya (1969: beach, 1 spec. + 2 valves). 2577 Near Solar pond (1971: beach, 1 spec.). 4070 Dahab (1969: beach, 1 spec.).
- Coll. author : Sharm el Sheick (leg. HUJ: 1 specimen).

1. *Chama asperella* Lamarck.

- MNHN (attached valve on the right:

22 x 21 mm). Identif. Lamy.

Al Sayad (Missd. Dollfus, 1904).

2. *Chama asperella* Lamarck.

- MNHN (max. measurements 27 x 24 mm).

Identif. Lamy: - var. *jukesi* Reeve.

Golfe de Tadjourah (Miss. Gravier, 1940).

3. *Chama asperella* Lamarck.

- MNHN (24 x 19 mm; 38 x 19 mm).

Identif. Lamy: - var. *unicornis* Brug.

Aden (Jousseume, 1917).

4. *Chama aspersa* Reeve.

- RNH (Beets collection. Reg. 770).

Ras Gharib, G. Suez (Beets, 1948-49).

5. *Chama gryphoides* Linné.

- Coll. author (1/1)

forma *circinato* (Monterosato).

Mediterranean: Brégançon, France (1980).

6. *Chama aspersa* Reeve.

- MNHN (spec. on the right: 20 x 20 mm).

Identif. Lamy.

Djibouti (Jousseume, 1917).

7. *Chama* cfr. *pacifica* Broderip.

- Coll. Peled (34 x 28 mm) (1/1).

Eilat North, G. Aqaba, 2-4 m (Peled, 1976).

8. = 7.

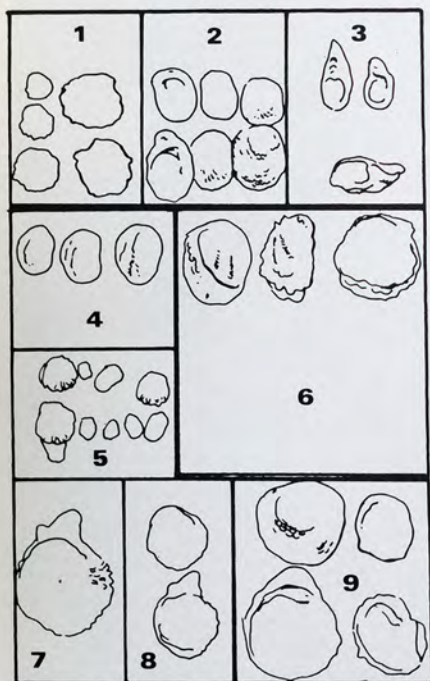
9. *Chama aspersa* Reeve.

- RNH (18760-18761 - left spec.: 38 x 32 mm).

Philippines.

(with orig. label: Sowerby & Fulton, London).

II





d'ARGENVILLE (1742: Tab. 23, fig. I) = *Spondylus* species (not *C. lazarus*). Left: *C. lazarus* (Ref. Linnei) d'ARGENVILLE (1742: Tab. 23, fig. F).

1. *Chama brassica elatensis* nov. subsp.  
Paratype 1. - Coll. Peled (64 x 56 mm).  
Sharm el Sheick, G. Aqaba  
(Peled, 1977: 2-4 m, coral).

2. *Chama brassica elatensis* nov. subsp.  
Paratype 4. - Coll. Haviland (64 x 62 mm).  
Eilat, G. Aqaba (Rapoport).

3. *Chama brassica* Reeve.  
- Coll. author (49 x 41 mm; Ch. 29).  
Locality unknown.

4. *Chama brassica elatensis* nov. subsp.  
Paratype 3. - Coll. Haviland (68 x 53/57 x  
65 mm).  
Eilat, G. Aqaba (Rapoport).

5. *Chama brassica elatensis* nov. subsp.  
Holotype. - Coll. Peled (63 x 45 mm).  
Eilat South, G. Aqaba (Peled, 3-1979).

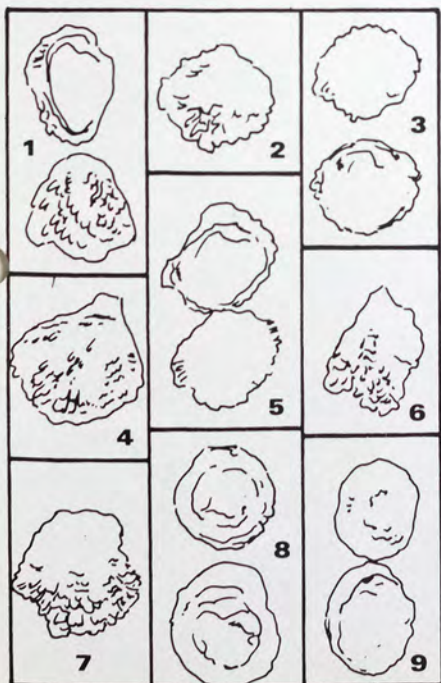
6. *Chama brassica elatensis* nov. subsp.  
Paratype 6. - Coll. Haviland (64 x 56 mm).  
Sharm el Sheick, G. Aqaba (don. Powell).

7. *Chama brassica* Reeve.  
- Coll. author (74 x 71 mm; Ch. 108).  
Philippines (leg. Montilla).

8. *Chama brassica* Reeve.  
- MNHN (Miss. Cherbonnier: 77 x 70 / 65 x  
64 mm).  
Ile Abulat. (= FRANC, 1956: 57).

9. *Chama brassica* Reeve.  
- Coll. author (68 x 56 / 60 x 50 mm; Ch.  
179).  
Tuléar, Madagascar  
(leg. prof. Rabesandratana).

III

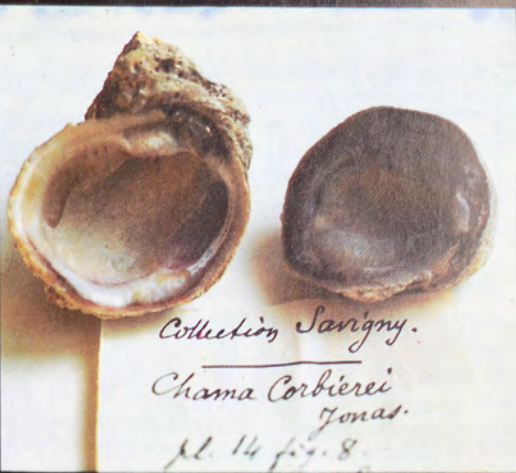








v. f. Jousseaume 1917 Family p. 308  
*Chama clauseni* Jona  
 det. Suez



Collection Savigny.  
*Chama Corbierei*  
 Jona.  
 pl. 14 fig. 8.



Chama  
*clauseni*  
 Jona.  
 det. Suez



Coll. C. Beets Reg 770  
 Ras Matarna (strand)  
 Golf van Suez  
 1848-1849





Deze kleurplaten waren  
mogelijk dank zij:

waarvoor de  
Belgische Vereniging voor  
Conchylologie bijzonder  
erkentelijk blijft.

De kleurbladzijden werden  
gedrukt op maco satiné  
135 gram.

Etn. Tuerlinckx N.V. drukkerij - uitgeverij



Westelsebaan 93/95 3281 AVERBODE

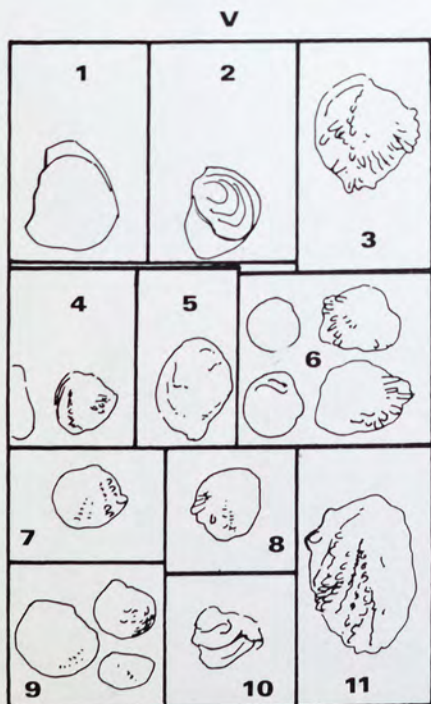
**PAPYRUS**

LAMORINIERESTRAAT 31-37  
2018 ANTWERPEN

03/230.88.80

1. *Pseudochama ruderalis rianae* nov. subsp.  
- MNHN. Identif. Lamy: *C. fimbriata* Rve.  
Design. holotype *P. ruderalis rianae*.  
Aden (Jousseume, 1917).
2. *Pseudochama ruderalis rianae* nov. subsp.  
- MNHN. Identif. Lamy: *C. fimbriata* Rve.  
Design. paratype *P. ruderalis rianae*.  
Aden (Jousseume, 1917) - free valve only.

3. *Chama fragum* Reeve.  
- Coll. Peled (40 x 36 mm).  
Eilat, G. Aqaba (Peled, 1972: 2-4 m, on  
rock),
4. *Chama aspersa* Reeve.  
- MNHN. Identif. Lamy: *C. fragum* Rve.  
Mer Rouge (Jousseume, 1917).
5. *Chama douvillei* Jousseume (in MS).  
- MNHN. Identif. Lamy: *C. Fragum* var.  
*douvillei*.  
Mer Rouge (Jousseume, 1917).
6. *Chama fragum* Reeve.  
- RNH:  
Karachi (left spec.) from G.B. Sowerby,  
1896.  
Karachi (richt spec.) from J. Mulder.
7. *Pseudochama* species.  
- TAU. (10 x 8,5 mm).  
Off Eilat (Ch. Lewinsohn, 1966: 20-27 fm).
8. *Chama asperella* Lamarck.  
- TAU. (10,5 x 9,5 mm).  
Off Mersat Abu Samra (Ch. Lewinsohn,  
1966: Rock dredge, 25-27 fm).
9. *Chama asperella* Lamarck.  
- TAU. (12 x 10 mm; 8 x 8 mm; 8,5 x 5  
mm).  
Off Eilat (Ch. Lewinsohn, 1966: 35-50 fm).
10. *Pseudochama ruderalis rianae?* (nov.  
subsp.)  
- TAU. (nepionic shell, attached valve).  
Off Eilat (Ch. Lewinsohn, 1966: 34-44 fm).

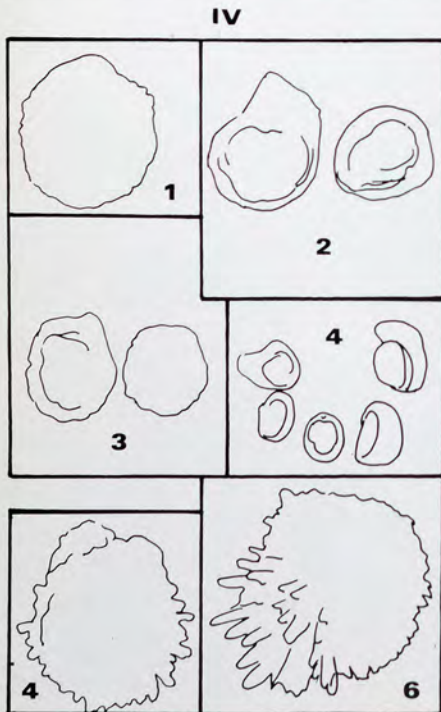


11. *Chama pacifica* forma *carditaeformis*  
(Reeve).  
- Coll. Peled (62 x 39 x 39 mm).  
Sharm el Sheick, G. Aqaba (Peled, 1978:  
1-2 m).

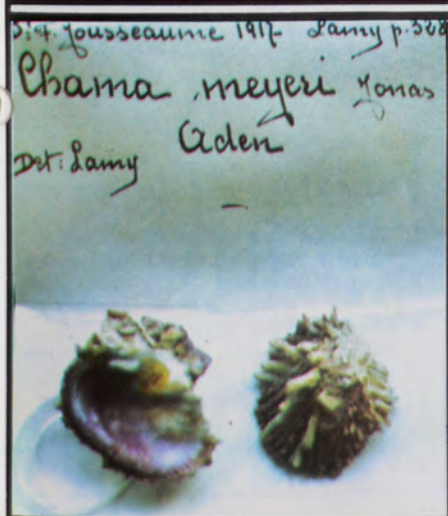
*Chama pacifica* Broderip, 1834.

Introduction. — We ask you to compare now: [plate I, fig. 4] with [plate IV, fig. 6] ; [pl. V, f. 11] with [pl. VI, f. 2] ; [pl. VII, f. 1] with [plate VII, f. 2]. Now you understand: No one outsider believes these six specimens belong to the same species, and must considered only to be forms! Without any doubt, this is the most beautiful and attractive species of the CHAMIDAE. Nearly each specimen of *C. pacifica* is different from the others. Broderip (1834) already warned: "The infinite variety of this species in shape and colours defies description." Nevertheless a lot of synonyms are created during the 19th century, of which we list the most important.

- C. pacifica* Broderip, 1834 (9 dec.). P.Z.S.: 184-151.  
*C. pacifica* Broderip, 1834 (23 dec.). Trans. Zool. Soc., I: 303, pl. 39, f. 1.  
*C. foliacea* Quoy & Gaimard, 1835 (non Gm.). Voy. Astrol. Zool.: 478, pl. 78, fig. 19.  
*C. meyeri* Jonas, 1846 (aug.). Zeitschr. Malakoz. III: 127.  
*C. claasseni* Jonas, 1846 (aug.) (idem): 127.  
*C. broderipi* Reeve, 1846 (dec.). Conch. Icon., IV: pl. I, spec. 2.  
*C. multisquamosa* Reeve, 1846 (dec.). -- : pl. III, spec. 12.  
*C. sulphurea* Reeve, 1846 (dec.). -- : pl. III, spec. 14.  
*C. pacifica* Brod. Reeve, 1846 (dec.). -- : pl. III, spec. 15.  
*C. reflexa* Reeve, 1846 (dec.). -- : pl. IV, spec. 16.  
*C. divaricata* Reeve, 1846 (dec.). -- : pl. IV, spec. 20.  
*C. carditaeformis* Reeve, 1847 (jan.). -- : pl. VI, spec. 33.  
*C. segmentina* Clessin, 1889. Conch. Cab.: 11, pl. 11, fig. 1-2.  
*C. convexa* Clessin, 1889. -- : 32, pl. 13, fig. 1-2.



1. ***Chama pacifica*** Broderip.  
- MNHN. Identif. Lamy: *C. claasseni* Jonas. Suez. (Jousseume-collection).
2. ***Pseudochama corbierei*** (Jonas).  
Lectotype of *C. corbierei* Jonas - MNHN. Suez (Savigny).  
Fig. in SAVIGNY (1817: pl. 14, f. 8).
3. ***Chama pacifica*** Broderip.  
- KBIN, I.G. 10591 (55 x 46 / 47 x 43 mm):  
*C. claasseni* Jonas.  
Aden (Jousseume, 1892).
4. ***Pseudochama corbierei*** (Jonas).  
- RNH (Beets-collection).  
Ras Matarma, G. Suez, beach (Beets, 1948-49).
5. ***Chama pacifica*** Broderip.  
Lectotype of *C. divaricata* Reeve.  
- BMNH (58 x 55 mm).  
Catbalonga, Is. of Samar, Philippines (Cum.).  
Fig. in REEVE (1846: pl. IV, 20).
6. ***Chama pacifica*** Broderip - forma *divaricata*.  
- Coll. Peled (30 x 26 mm). Identif. author. Sharm el Sheick, G. Aqaba, 2-3 m (Peled, 1977).



1917. Jousseaume 1917. Lamy p. 273  
*Chama fimbriata* Re  
 Oden  
 det. Re...  
 J. Jousseaume 1917  
*Chama fimbriata* Re  
 Oden



1917. Jousseaume 1917. Lamy p. 273  
*Chama fimbriata* Re  
 Oden  
 det. Lamy  
 J. Jousseaume 1917  
*Chama fimbriata* Re  
 Oden



Jousseaume 1917. Lamy p. 273  
*Chama fragum* Re  
 Mer Rouge  
 det. Jousseaume 1917  
*Chama fragum* Re  
 Mer Rouge



Dowdell  
 Mer Rouge  
 det. Jousseaume 1917  
*Chama Dowdell* Lamy  
 Mer Rouge



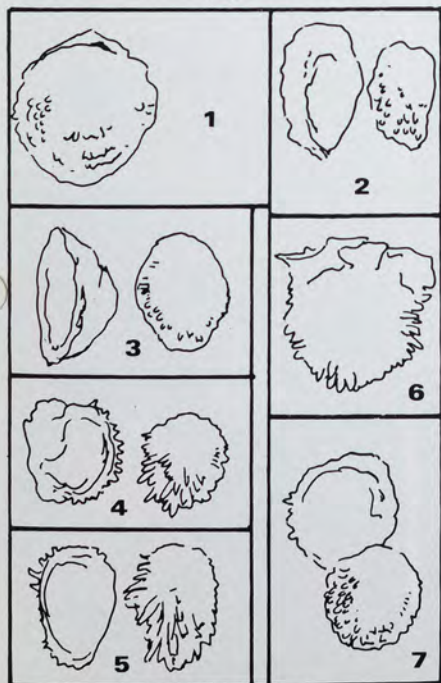
But than Reeve began to split the species:

*C. broderipi*. The holotype is present in BMNH, measurements 90 x 65 mm. This type specimen is represented on our plate I, fig. 5. Type locality: "Lord Hood's Island, Pacific Ocean (found attached to large *Aviculae* at the depth of six fathoms); Cuming." Reeve described *C. broderipi* from the specimen identified by Broderip "C. pacifica (var.)", convinced that Broderip made an error including this specimen in *C. pacifica*. It is a pale colour-form.

The problem started especially when Reeve figured a specimen under the name *C. pacifica*, according not a all with the type figure of BRODERIP. This extremely oblong form with few spines (cfr. REEVE's *pacifica*) we found in RNH and is represented on our plate VII, fig. 2 in colours. See also the figures on the plate in this species. Clessin (1889: 23) was convinced this was a new species: *C. segmentina*.

In the meantime Reeve described his *C. reflexa*: An orbicular form, with a lot of short scales on the free valve, but merely with a "reflected" margin of the attached valve. Two syntypes are kept in BMNH of which we select as lectotype the specimen figured in REEVE, 1846: pl. IV, f. 16) and represented on our plate I, fig. 4. Type locality: "Darney Island, North Australia; Jukes." During years we also were convinced that *C. reflexa* Reeve was a valid species or at least a subspecies of

## VII



1. *Chama pacifica* Broderip.  
Lectotype. - BMNH (75 x 66 mm).  
Lord Hood's Island, Pacific Oc. (Cuming).  
Fig. in BRODERIP (1834 b: pl. 39, f. 1).
2. *Chama pacifica* Broderip.  
- RNH (80 x 44 / 55 x 33 mm).  
ex. Geol. Mus. Wageningen.  
Eiland Lord Hood.
3. *Chama pacifica* Broderip.  
- RNH ("*C. brassica*"). Identif. author.  
Philippines (Coll. J. Mulder).
4. *Chama pacifica* Broderip.  
- Coll. Peled (30 x 26 mm). Identif. author.  
Sharm el Sheick, G. Aqaba, 2-3 m (Peled,  
1977).
5. *Chama pacifica* Broderip.  
- Coll. Peled. (34 x 28 mm). Identif. author.  
Eilat Norht, G. Aqaba, 2-4 m (Peled, 1976).
6. *Chama pacifica* Broderip.  
- Coll. Peled (50 x 45 / 36 x 39 mm + juv.  
on the right 19 x 14 mm). Identif. author.  
Nabeck, 185 km south of Eilat, 2-3 m (Peled,  
1977).
7. *Chama pacifica* Broderip.  
- Coll. Peled (40 x 40 mm). Identif. author.  
Eilat, G. Aqaba, 6-7 m (Peled, 1983).

Original description. — "Chama testa rubra purpurea vel lutea, lamellis creberrimis, foliis seu squamulis brevioribus interdum albidis; limbo interne crenato." BRODERIP.

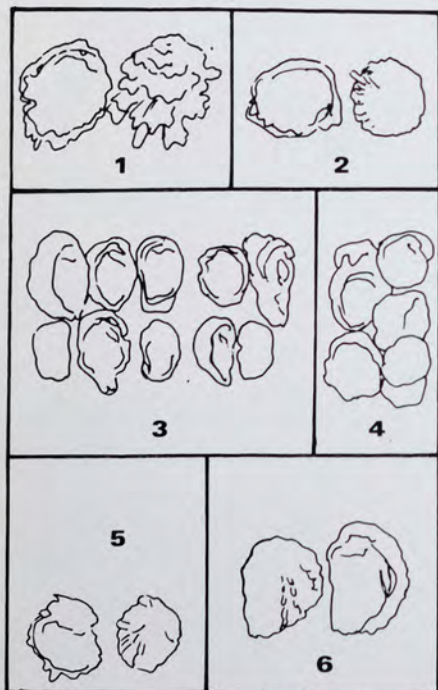
Type material. — The lectotype of *C. pacifica* Broderip is present in BMNH. It is the type specimen excellently figured in BRODERIP (1834 b: pl. 39, f. 1) and measures 75 x 66 mm. We represent the lectotype on plate VII, fig. 1.

Type locality. — By original designation: "In Oceano Pacifico. (Lord Hood's Island. - Pearls Islands.). Hab. Obtained by diving for the large Aviculae to which it attaches."

Distribution. — Broad Indo-Pacific. Living in the Red Sea and the Gulf of Aqaba and rarely in the Gulf of Suez.

Discussion. — Besides *Chama* (= *Pseudochama*) *corbierei*, JONAS (1846) described two "new species", *C. meyeri* and *C. claasseni* - in fact only insignificant forms of *C. pacifica*. Type localities: "M. rubro". Comparing the descriptions, *C. meyeri* has the attached valve flat and thin, the free valve "lamellis appressis subimbricata", whereas *C. claasseni* has a swollen attached valve. We found beautiful specimens in MNHN (Coll. Jousseume) and identified by Lamy who characterized *C. claasseni* as a red shell with white scales in radial rows (LAMY, 1921: 240). These specimens are represented on plate IV, f. 1 and plate VI, f. 5).

## VI



1. *Chama lazarus* Linné.  
- Coll. author (76 x 74 / 75 x 75 mm).  
Eilat, G. Aqaba, 2-4 m, on coral.
2. *Chama pacifica* Broderip.  
- Coll. author (27 x 30 / 24 x 24 mm).  
Eilat North, G. Aqaba, 2-4 m, on rock.
3. *Chama limbula* Lamarck.  
Syntypes. - MNHN, labeled:  
"Individus nommés par Lamarck"  
Nouvelle Hollande (Péron & Lesueur, 1808).
4. *Chama limbula* Lamarck.  
- MNHN.  
Djibouti (Miss. Ch. Gravier, 1804).
5. *Chama pacifica* Broderip forma *meyeri*.  
- MNHN. Identif. Lamy: *C. meyeri* Jonas.  
Aden (Jousseume, 1917).
6. *Chama pacifica* Broderip.  
- Coll. author (43 x 27 x 26 / 36 x 28 mm).  
(erroneously printed in mirrorimage)  
Eilat North, G. Aqaba, 2-4 m.





D: 4. Jollisseaume 1917 Lamy p. 37

*Chama radians* Lk.

det: Lamy Aden

D'Arny 1917  
*Chama radians* Lk  
 Aden

B.M. (N.H.) reg. no: B50-11-1-54  
FIGURED SYNTYPE

*Chama pacifica*

Broderip 1834 (P.Z.S.: 149.

Lord Hood's Island  
(Pearl Islands)...

H. CUMING colln.

1 spec.<sup>a</sup> Acc. no: 1829

(of 93)

... attached to *Aviculae*  
(...) at a depth ranging  
from three to seven  
fathoms, obtained  
by diving



*Chama (Chama) pacifica* Cuv.  
Genl. Atlas Voyages Pacif.  
Pl. 227  
Cuv. et Gmel. Pl. 227



type specimen becomes consequently paralectotype. Type locality: "Catbalonga, Island of Samar, Philippines." It is the form, grown up in ecologically ideal circumstances, producing extremely long scales in radial rows from the umbon (free valve) and in concentric rows near the margin. See our plate IV, fig. 6, representing a specimen from Coll. Peled.

*C. carditaeformis*. Holotype in BMNH, measurements 45 x 27 mm., without type locality. It is an extremely transversely oblong specimen, with complete radial rows of small, sharp scales. We were very surprised to found two specimens with the forma *carditaeformis* in Coll. Peled (collected off Eilat North Beach, 1973: 57 x 38 mm; off Sharm el Sheick, 1978: 62 x 39 mm).

At last we already indicated *C. segmentina* Clessin is an oblong form (it seems to be only a "segment" of a complete free valve), and so is *C. convexa* Clessin only the "convex" formed *C. pacifica*.

We tried to illustrate the several forms of *C. pacifica*. Also on our colourplates, especially plate VIII, which represents no other species than *C. pacifica*. All our photographs together are good enough to identify specimens of *C. pacifica*. It does not need other descriptions.

#### Literature records.

JONAS (1846: 127) *C. meyeri*: In Mari rubro.

JONAS (1846: 127) *C. claasseni*: In Mari rubro.

ISSEL (1869: 79) *C. meyeri* (ex. JONAS).

ISSEL (1869: 79) *C. claasseni* (ex. JONAS) - ISSEL noted erroneously both to be "sinistrorse" (= *Pseudochama*).

M'ANDREW (1870: 447) *C. reflexa*: Shallow water, common.

MALTZAN (1871: 203) *C. reflexa*: Suez.

COOKE (1886: 96) *C. reflexa* (ex. M'ANDREW, 1870).

JOUSSEAUME (1888: 210) *C. divaricata*: Ile Camaran. "Une valve supérieure recueillie sur le rivage".

ANTHONY (1905: 492) *C. reflexa*: Djibouti.

LAMY (1921: 239) *C. reflexa*: Suez; Massauah; Djibouti; Périm; Aden.

LAMY (1927: 319-321) *C. pacifica*: No locality from the Red Sea.

LAMY (1927: 326-328) *C. reflexa*: Suez (L. Vaillant, 1904); Suez; Massauah; Djibouti; Aden; Périm (Dr. Jousseume, 1917); Golfe de Tadjourah (Ch. Gravier, 1905).

LAMY (1938: 24) *C. reflexa*: Sénafir; plage entre Suez et Ataka; Golfe de Suez (4 stations); Jubal.

MOAZZO (1939: 71) *C. reflexa*: Fontaines de Moise: banc Kalah el-Kebira; Ras Sudr; Crique de Suez (vivants); plage de Suez; Sud de la jetée Lavalley; Ataka; Port-Tewfik; Chalouf; Geneffe (rejetés).

FRANC (1956: 58) *C. reflexa*: Piles de la jetée du port de Djeddah; câble caoutchouté immergé à 1-5 m sous cette jetée.

TADJALLI-POUR (1973: 166-167) *C. reflexa*: (Gulf of Oman).

MASTALLER (1979: 150) *C. reflexa*: Aqaba, unter Bouldern und Mikroatollen, selten, 2 ex.

DE BRAUWER (1981: n° 180) - species: Hurghada, Egypte [= *C. pacifica* forma *convexa* (Clessin)].

SHARABATI (1984: Pl. 45, f. 8 a; pl. 46, f. 1, 1 a, 1 b) *C. pacifica*.

TAYLOR & REID (1984: 207) *Chama* cf. *reflexa* Reeve: Harvey and Baraja Reefs.

Note: See our remark under *C. broderipi*.

#### Material in collections.

HUJ : 35757 Eilat (B. Sheinberg, 1973: 1 specimen).

35784 Massaua (Ex coll. Coen, n° 9445A: 1 specimen 45 x 34 mm, living on Tridacna). 35785 Massaua (Ex. coll. Coen, n° 9945 B: 1 free valve 33 x 33 mm, on sponge).

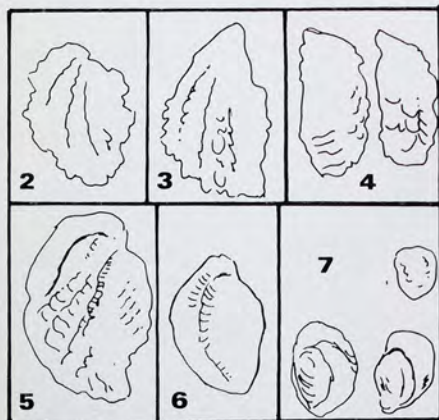
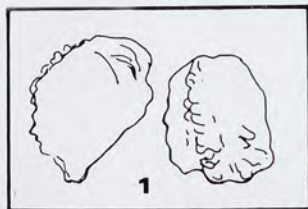
KBIN : Dautz. coll., drawer 1571. *C. claasseni* - Aden (Jousseume, 1892: 2 specimens, IG 10591, 55 x 46 / 47 x 43 mm; 43 x 35 / 42 x 35 mm).

*C. pacifica* Broderip, separated from the species *C. pacifica* Reeve (not Broderip). A badly eroded valve collected in the Andaman Islands (Snake Is., in 1983) and a cluster of orbicular and oblong specimens of *C. pacifica* (Red Skin Is.,-) cleared up our mind. A locotype (Mrs. Marescot, Tuamutu arch.) and specimens from the Solomons (Mrs. Kengalu) besides a lot of Philippine's specimens (Mr. Montilla) convinced us. *C. reflexa* is only the flat, orbicular form, mostly with a lot of small scales of *C. pacifica*. Because this form is living together with f.i. *C. pacifica* forma *segmentina* or *C. pacifica* forma *divaricata*, it cannot be considered a subspecies.

*C. multisquamosa* is the form *reflexa*, but with still more small scales. In the original description, *C. multisquamosa* was said to be "whitisch, tinged with rose, scales snowy white, interior white, tinged with rose". In coll. author an Australian specimen resembles completely the type specimen in the BMNH, but from the same locality in Australia an other specimen of the forma *multisquamosa* is deep orange! Comparing the type of *C. sulphurea* Reeve in BMNH with *C. multisquamosa* and *C. reflexa* Reeve - *sulphurea* indicates only a citron-coloured specimen.

*C. divaricata*. Two syntypes are kept in BMNH. The specimen with the measurements 58 x 55 mm, is hereby selected lectotype, It is the specimen figured in REEVE (1846: pl. IV, f. 20) and represented on our plate IV, fig. 5. The other

## VIII



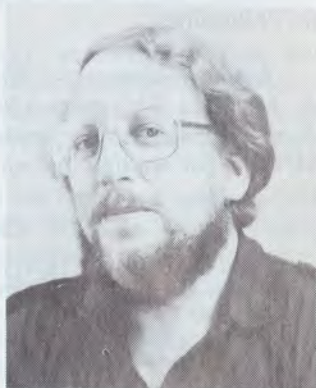
- 1. *Chama yaroni* new species.**  
Holotype: 57 x 34 x 26 / 48 x 36 mm.  
- Coll. author: Ch. 24 - be depos. in KBIN.  
Eilat North, G. Aqaba (Peled, 1977).
- 2. *Chama yaroni* new species.**  
Paratype 1: 52 x 47 x 21 / 46 x 41 mm.  
- Coll. author: Ch. 25 - don. Haviland.  
Eilat, G. Aqaba (Rapoport, 1977).
- 3. *Chama yaroni* new species.**  
Paratype 2: 58 x 35 x 26 / 47 x 39 mm.  
- Coll. Haviland.  
Sharm el Sheick, G. Aqaba.
- 4. *Chama yaroni* new species.**  
Attached valves of the holotype (left)  
and paratype 1 (right).
- 5. *Chama plinthota* Cox.**  
(Syn.: *C. imbricata* Broderip).  
- Coll. author: Ch. 74 (85 x 48 x 34 /  
68 x 52 mm).  
Ex. Coll. Eaton Shell Shop (London):  
Labeled "W.I. 1856".
- 6. *Chama plinthota* Cox.**  
(Syn.: *C. imbricata* Broderip).  
- Coll. author: Ch. 233 (43 x 27 /  
37 x 24 mm).  
Eilat, Coral Beach, G. Aqaba (leg. E. Wils).
- 7. *Pseudochama ruderalis rianae* nov. subsp.**  
- MNHN. Identif. Lamy: *Chama radians*  
Lk.  
Spec. on the left: 32 x 22 mm.  
Aden (Jousseume, 1917).

The author: **A. Delsaerd.**

After his first revision (Recent TURBINELLI-DAE), the author started this study 8 years ago. CHAMIDAE were studied in the type collections and general collections in BMNH, KBIN, MHNG, MNHN, RNH, ZMA, and also the Zoological Survey of India (Calcutta, 1983). Personal meetings with dr. I. Yaron intensified the study of worldwide CHAMIDAE to a partial revision, limited to the Red Sea (although nearly each species has an Indo-Pacific distribution).

Red Sea material of CHAMIDAE was borrowed for study from HUJ, SMF, TAU, and the private collections of mr. Haviland (Florida), mr. Peled (Israel) and dr. Yaron (Israel).

In the following years the author will try to extend his collection of Neritacea. Who can help?



This study intends to open the discussion between *Chama*-freeks  
- if there are

### ***Chama douvillei* "Jousseaume" Lamy, 1921.**

*C. douvillei* "Jousseaume" Lamy, 1921: 308.

*C. fragum* var. *douvillei* "Jousseaume" Lamy, 1927: 367.

*C. macrophylla* (Gmelin, 1792) sensu Tadjalli-Pour, 1973: 167, pl., XXIII, f. 7-8.

Discussion. — Jousseaume described in manuscript a new species, collected off Aden (1917). LAMY (1927) considered *C. douvillei* only a forma of *C. fragum* Reeve. We are convinced that Lamy misinterpreted *C. fragum* Reeve. It is difficult (in our opinion) to recognize a form of *C. fragum* in the specimen *C. douvillei* Jousseaume (represented on plate V, fig. 5). TADJALLI-POUR (1973) mentioned *C. macrophylla* Gm. (the popular jewel-box from Florida-coasts): Convinced that this was a misidentification, we examined the specimens of Tadjalli-Pour, kept in MNHN and represented by him in his plate XXIII. We were very surprised: In fact they belong to *C. douvillei* Jousseaume! In our view these specimens are near to *C. pacifica*, but we cannot make a conclusion. Interesting are the notes by Tadjalli-Pour concerning the habitat: "Cette espèce est trouvée sur les coraux en eau profonde, surtout aux endroits où l'agitation de l'eau est assez forte. Nous l'avons récoltée à Qechm où elle est commune. Nous avons trouvé à la station de Lingeh, des exemplaires de ce Mollusque différant de l'espèce type par leur taille (hauteur 72 mm et longueur 52 mm). A la station de l'île de Kharg, d'autres échantillons étaient de couleur blanche..." (TADJALLI-POUR, 1973: 167).

### **Note on *C. foliacea* Quoy & Gaimard, 1835.**

In the collection of the MHNG the following interpretation can be stated: *C. foliacea* Q. & G. = *C. purpurata* Chenu = *C. rubea* Reeve. In coll. author two specimens

according to this interpretation, loc.: Baja California, Mexico, and 1 specimen from the Philippines.

**Acknowledgment.** — We are very grateful to Mrs. Kengalu (Solomon Is.) and Mr. Montilla (Philippines) for sending beautiful material of *C. pacifica*. To Mrs. Marescot (Tuamotu) for sending a locotype and information. We thank dr. Métivier (MNHN) for sending in loan the specimens of Tadjalli-Pour.

### *Chama plinthota* Cox, 1927

*C. imbricata* Broderip, 1834 (3 dec.). P.Z.S.: 149-150.

*C. imbricata* Broderip, 1834 (23 dec.). Trans. Zool. Soc., I: 304, pl. 39, f. 2.

*C. savigny* "Jousseume" Lamy, 1921. Chames Mer Rouge: 238.

*C. plinthota* (nom. mut.) Cox, 1927: 98.

*C. annarsae* Selli, 1973. Moll. quaternari di Massauna & Gibuti: 213.

Original description. — "Chama testa lamellosa, squamis imbricata, albida purpureo-fusco varia; valva superiore subdepressa, sublobata, sinu ab umbone usque ad limbum currente; intus albida, limbo integro, sapissime nigro-purpureo." BRODERIP (1834 a/b).

Type material. — The holotype of *Chama imbricata* Broderip is in BMNH, measurements 95 x 62 mm, and is sufficiently figured in BRODERIP (1834b: pl. 39, f. 2). The species is accurately figured in REEVE (1846: pl. I, f. 3 and pl. VI, f. 3b).

Type locality. — By original designation: "In Oceano Pacifico (Lord Hood's Island. - Pearl Islands)"

Note: Lord Hood's Island = Marutea = in the Tuamutu Arch.

Habitat. — "Attached to large *Aviculae* at depths ranging from three to seven fathoms" BRODERIP. "Attached to a rough piece of madrepora" REEVE (1846). The habitats of topotypes described by Mrs. Marescot (in litt.) as follows: "...accrochés au sol corallien, dans le lagon, par moins d'un mètre d'eau; à l'Est de lagon de Rangiroa, ils sont en colonies très importantes."

Distribution. — In KBIN (Dautzenberg collection) interesting material is kept from Réunion (Dollfus); Marqueses; Tahiti (Cuilliéret, 1890); Mauritius (Robillard). Tuléar, Madagascar (G. Petit, 1926).

It is an Indo-Pacific species, without any doubt living in the Red Sea and the Gulfs of Aqaba and Suez.

Discussion. — Although Lamy (1927: 321-323) regarded *C. imbricata* Broderip as a variable species, Reeve (1846) stated already: "...the present species is one in which the characters above described are more than usually permanent." Therefore without synonyms. Easily to recognize, even if calcification hides every sculpture on the outside (as in most of the specimens).

#### History of the name *Chama imbricata*:

The name *Chama imbricata* was used for the first time by CHEMNITZ (1784, VII: 100, 122; pl. XLIX, f. 495) for the species described by LINNE (1758: 691) as *Chama gigas* (= *Tridacna gigas*).

Gmelin (1791: 3304) based on CHEMN. (pl. LII, f. 514-515) his *Chama macerophylla* (the well known "jewelbox"-*Chama* from Florida). This same species,

figured in CHEMN. (f. 514-515) is named by Lamarck (1801: 131) *C. imbricata* (= *C. macerophylla* Gm.).

Later on Lamarck (1819: 93) described the species *C. macerophylla* Gm., but than under the name of *C. lazarus* Linné - although Lamarck (1801) correctly identified CHEMN. (pl. LI, f. 507-509) as *C. lazarus* Linné, 1758, This confusion by Lamarck was already remarked y Deshayes in the second edition of An. s. Vert. (1835, VI: 580).

Broderip (1834) used the name *imbricata* again, but for a new species of the genus *Chama*. His decription and the figure (1834 b: pl. 39), f. 2), very accurately represented in REEVE (1846: pl. I, 3 and pl. VI, 3b) made the beautiful *C. imbricata* Broderip one of the best know *Chama*-species, found with this name in each museum-collection.

Unfortunately but according with the rules of nomenclature, COX (1927: 98) changed the name *Chama imbricata* Brod. into *Chama plinthota* (a characteristic name as the Greek "plinthōtos" means: tiled).

#### Summary:

*Chama imbricata* Chemn., 1784 = junior syn. of *Tridacna gigas* (Linné, 1758).  
*Chama imbricata* Lam., 1801 = junior syn. of *Chama macerophylla* Gm., 1791.  
*Chama lazarus* Lam., 1819 = junior syn. of *Chama macerophylla* Gm., 1791.  
*Chama imbricata* Broderip; 1834 a valid species, but junior homonym.  
*Chama plinthota* Cox, 1927 nomen mutatum for *Chama imbricata* Brod., 1834.

*Chama savigny* "Jousseume" Lamy, 1921: The original description was made by Jousseume in manuscript, published by Lamy (1921: 238). According with LAMY (1927: 321-323) we consider *C. savigny* only a form of *C. plinthota* as "...caractérisée surtout par l'existence, sur la valve inférieure, de côtes noduleuses blanches séparées par des intervalles d'un brun-rouge." (LAMY, 1927), and thus synonym of *C. plinthota* Cox.

*Chama annarosae* Selli, 1973 also conspecific. Type material: 2 valves (Massaua) and 3 free valves (Djibouti). The description and the figures in SELLI (1973: 213, tav. VII, f. 4 a-b, 5, 6 a-b, 7 a-c) make us convinced that *C. annarosae* is a subfossil form of *C. plinthota* (SELLI mentions *C. imbricata* Brod. only as resembling *C. brassica*!). Indeed, badly eroded specimens of *C. plinthota* are compared with *C. annarosae* and are very resembling.

#### Literature records.

ANTHONY (1905: 492) Djibouti.

LAMY (1921: 238) Massaouah; Djibouti; Aden.

LAMY (1927: 323) Mer Rouge (Jousseume coll.); Golfe de Tadjourah (Ch. Gravier, 1904); var. *savigny*: Aden.

LAMY (1938: 23) Jubal.

FRANC (1956: 57) Cap sud, par 2 m; Ile Abulat - subfossils.

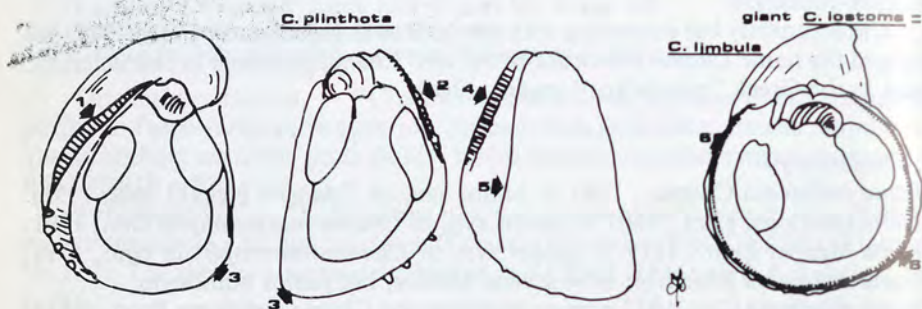
TADJALLI-POUR (1974: 166) Buchehr; Siri (rare). = Persian Gulf.

MASTALLER (1978: 139) *Chama* sp. Port Sudan.

MASTALLER (1979: 150) Aqaba (Eulitoralbereich, auf Kalkfelsplatten, häufig, 6 Ex.); Pt. Sudan (litorale Felsbrocken und Riffplattform, häufig, 1 Ex.).

Material in collections.

- HUJ : 35752 Elat (J. Heller, 1980: Veneria Lagoon). 35753 Elat. 35754 Aqaba (G. Haas, 1940). 35756 Sharm el Sheikh (B. Sheinberg, 1971). 35765 Nabeq (H.K. Mienis, 1969). 35766 Elat. 32339 Dahab (P. Goldschmidt, 1972). 35769 Dahab (H.K. Mienis, 1969). 35774 Aqaba (G. Haas, 1949). 35777 Elat, Bet. Williams, 35778 Elat, Coral Beach (M. Plattner, 1976).
- KBIN : Dautz. coll., drawer 1573; (see: distribution)
- MNHN : Ile Abulat (Miss. Cherbonnier, - subfossils).
- ZMA : Saoedi Arabiée, 55 km N. van Jeddah (J.E. Williams, 1968: 5 specimens).
- Coll. Yaron : 1370 Ras Muhammed (1969: beach, 1 spec.). 2693 Bir es Suweir (1971: beach, 1 valve). 3843 Nevioth (1975: beach, 4 spec.).
- Coll. author : Eilat, Coral Beach (Leg. E. Wils) represented on our pl. VIII, fig. 6.



**Chama plinthota**. 1. dentate groove 2. toothed side of the free valve 3. smooth inner margins 4. according with the toothed side a row of short lines can be found on the outside of the free valve 5. even in eroded specimens this groove is always stated - **Chama limbula** (copied from a giant specimen, SMF - identif. *C. iostoma*) 6. minutely crenulated inner margins (the marks 1-4 are never found in this species).

### **Pseudochama radians** (Lamarck, 1819).

*Chama radians* Lamarck, 1819. An. s. Vert., VI: 96.

Original description. — "Ch. testa rotundata, crassa, oblique affixa, albo et rufo radiata; lamellis brevissimis, confertis, adpressis; margine integro." LAMARCK.

Ref.: "Favanne Conch. pl. 80 f. D; Chemn. Conch. 9 tab. 116 f. 992; Encycl. pl. 196 f. 3"

Type material. — Holotype of *Pseudochama radians* (Lamarck) is in MHNG (Lamarck coll.), figured in CHENU (1843-50: pl. IV, f. 7).

Type locality. — Lamarck (1819) designated with a question-mark; "l'Océan des Grandes-Indes?". Indeed, this is not correct. Lamarck founded his species on the figure in CHEMN. (tab. 116, f. 992), also in his Encycl. Méth. A similar figure, identified *C. radians* Lamarck, is in REEVE (1846: pl. IV, f. 19). CHEMN. mentions "St Croix" the locality of the figured specimen. In the own collection we have several specimens of *Pseudochama radians* from Brasil. We are convinced that the locality in CHEMN. is correct. We herewith designate St. Croix, Lesser Antilles, as corrected type locality.

Distribution. — Southern Florida and the West Indies, to Brasil.



Literature records.

PAETEL (1869: 110) M. rubr.

ISSEL (1869: 381 - appendice) n° 593, ex Paetel's Catalog.

LAMY (1921: 310) Aden.

Remarks. — We examined the material reported by Lamy from Aden (MNHN, Jousseume coll.), figured on our pl. VIII, f. 7: As Lamy himself remarked the specimens resemble *C. fimbriata* Reeve (an invalved name as already stated). We consider these specimens to belong to a new subspecies, see *Pseudochama ruderalis rianae* nov. subsp., not related to *P. radians* (Lamarck).

### ***Pseudochama ruderalis* (Lamarck, 1819).**

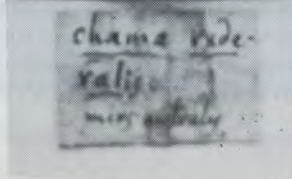
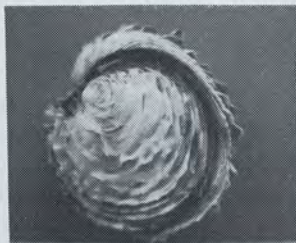
*Chama ruderalis* Lamarck, 1819. An. s. Vert., VI: 96 ("Came rudérale").

Original description. — "Ch. testa orbiculari, lamellosa, albida, roseo tincta; lamella partim elevatis, valvae majoris undato-plicatis." LAMARCK.

Type material. — The holotype of *Chama ruderalis* Lamarck is in MHNG. On the inside marked: "Coll. Lk. TYPE 1087/5". The holotype measures 32 x 30 mm and is accompanied by the original label with the type locality "Mers australes". It is figured in DELESSERT (1841: pl. 13, f. 5 a-b); DESHAYES (1839-57: pl. 28, f. 9-11) and in CHENU (1843-50: pl. 5, f. 2-2c).

Type locality. — By original designation: "Mers australes". We are not able to restrict more accurately this locality.

Discussion. — After the original description of *Chama ruderalis* and its type locality, Lamarck noted "Mon cabinet" - what means that the holotype was in his own collection and not in the Museum collection. This is the reason why the holotype remains now in MHNG (Lamarck collection → prince Masséna → B. de Lessert → Fr. de Lessert → Geneva). It is correct that the inside of the holotype is of a yellowish white with a touch of pink, as the original description says. In the general collection of the MHNG is a conformable specimen with the lamellae in exceptional good condition. This specimen and the holotype are figured below. It illustrates very well the typical *Pseudochama ruderalis ruderalis*: with the concentric rows of lamellae, the attached valve with an outgrowth, the free valve however circular - a distinguishing mark in comparison with the following.



*chama ruderalis* Lam.

***Pseudochama ruderalis* (Lamarck, 1819) "var. b"**

*Chama ruderalis* (b) Lamarck, 1819. An. s. Vert., VI: 96.

*Chama fimbriata* Reeve, 1847. Conch. Icon., IV: pl. VIII, spec. 41.

Original description. — "(b) Var. testa lamellis brevioribus subscrispis; valva minore convexiuscula." LAMARCK.

Type material. — The lectotype, hereby selected, is in MNHN. It is the complete specimen on the hardboard-label, marked "Chama ruderalis Lam. var (b). Port Jackson / par Péron et Lesueur (Individus nommés par Lamarck)". It measures 32 x 35 mm. The attached valve on the left (see below), consequently the paralectotype, measures 34 x 26 mm.

Type locality. — "Port Jackson (Péron et Lesueur)".

Discussion. — In his original description, Lamarck distinguished a variety, from Port Jackson. It was already Lamy (1917: 267; 1927: 373-374) who stated that this "var. b" of *C. ruderalis* Lamarck agrees completely with *C. fimbriata* Reeve, 1847. We compared the types: No doubt the opinion of Lamy is correct: the general form, the external sculpture, the inner margins crenulated, the muscle-scars and the colour inside being yellowish white... all are the same. Possibly this is a valid subspecies? However the state of *Pseudochama ruderalis* "var. b", living in South Australia, *fimbriata* (Reeve) is an invalid name as we explained before.

***Pseudochama ruderalis rianae* nov. subsp.**

*Chama fimbriata* Reeve (sensu) Lamy, 1927. Chama Vivants: 373-375.

*Chama radians* Lamarck (sensu) Lamy, 1927. Chama Vivants: 375-376.

Description. — The Red Sea-specimens approximate *Pseudochama ruderalis* "var. b" (Lamarck) from Australia, having the shape of the free (left) valve oblong to triangular and not circular as *P. ruderalis ruderalis*. On this valve the concentric ranged lamellae are cruched, a little more erected on the left. As the free valve grows clockwise (*Pseudochama*) an outgrowth, below to the left, is seen in adults. A touch of rust-brown on the attached valve, but conspicuous on the free valve.

Type material. — The holotype hereby designated, is the specimen figured on plate V, fig. 1; it is kept in MNHN (Jousseume collection), identified by Lamy "Chama fimbriata Rve". Paratype is the left valve, figured on plate V, fig. 2.

Type locality. — Aden.

Discussion. — The new subspecies only can be confused with *Pseudochama corbierei* (in Red Sea-specimens), but the more circular shape of this last, the purple inside, especially the smooth margins are distinguishing marks. In our opinion the specimens identified by Lamy "*Chama radians*" "LK" (MNHN, Jousseume coll.), figured on plate VIII, fig. 7, belong to the same subspecies. Although most of the *Chama*-species in the Red Sea have a distribution broad Indo-Pacific, a gap is marked in the distribution between the Red Sea-subspecies and the Australian *P. ruderalis*: No one specimen we recorded in museums or private collections, from India, Indonesia and the Philippines f.i. Perhaps a full specific-rank is defensible, but by way of precaution we prefer to regard it only as a new subspecies. Study on the fossil ancestor can clear up the problem.

#### Literature records.

- LAMY (1927; 375) *C. fimbriata*: Djibouti; Aden (Jousseume, 1917).  
 LAMY (1927; 376) *C. radians*: Aden (Jousseume, 1917).  
 LAMY (1938; 24) *C. fimbriata*: Golfe de Suez (st. XVII ter).  
 MASTALLER (1979; 150) *C. fimbriata*: only repeating LAMY (1927; 1938).

#### Material in collections.

- HUJ : 35776 Um Rashrash (G. Haas, 1941: 1 attached valve).  
 35783 Massaua (ex coll. Coen, n° 9446: complete specimen, on *Tridacna*, 45 x 26 / 32 x 25 mm.).  
 KBIN : Dautz. coll., drawer 1571 *P. corbierei* (misidentif., = *P. ruderalis rianae* nov. subsp.) Aden (Jousseume, 1892: 40 x 28 / 32 x 25).  
 MNHN : *C. fimbriata* (identif. Lamy) Aden (holotype and paratype *C. ruderalis rianae*, figured on plate V).  
*C. fimbriata* (Identif. Lamy) Djibouti (Jousseume, 1917: 4 specimens - largest with attached valve 21 x 13 mm).  
*C. radians* (Identif. Lamy) Aden (Jousseume, 1917: 3 specimens, figured on plate VIII, largest 32 x 22 mm).  
 TAU : Off Eilat (Ch. Lewinsohn, 1966, 34-44 fm.: attached valve, figured on plate V, fig. 10, identification by the author with a question-mark). Eilat (D. Zalcman, 1970, Grab, 270 m, Op. New Port: nepionic attached valve).

Name. — The new subspecies is named - *rianae*, dedicated to the beloved wife of the author, a very patient partner during the long and nervous work for this revision.



*Chama yaroni* new species. Paratype 3 and 4. Loc.: Eilat.-Coll. Rapoport (Israel)

***Chama yaroni* new species.**

Introduction. — In 1980, the present author received two specimens of a Red Sea *Chama*: One from D. Peled (Israël), and one from E. Haviland (Florida). In spite of their remarkable sculpture and large dimensions of the valves, identification with any known species was not possible. After five years of study and careful comparison with types and other material from related species, these specimens must be considered as belonging to a new species.

Diagnosis. — Shell oblong-oval. Both valves with a striking foliation sculpture. Exterior salmon-yellow. Interior white, with some purplish in the hinge part or along the margins.

Description. — The general form of the species is oblong-oval. On the free (right) valve tens (35-40) of striking parallel brown lines are visible between the margin of the posterior part and the first row of foliation. From the umbones to the opposite margin a kind of furrow is formed between the two rows of foliation. The lamellae of these foliation are thin and smooth and individually separated from their bases on. In the second row of lamellae, near the middle part of the upper valve, some lamellae divide and produce a third row of scales. Between the three rows of foliation, the same brown colour (as from the parallel lines on the left) is seen. The salmon-coloured lamellae and brown rays are parallel to the margin of the posterior part, thus running counterclockwise. Also on the anterior part of the upper valve there are some conspicuous lamellae.

The attached (left) valve shows an imbricated sculpture around the cemented part, forming radial rows of lamellae similar to the foliation on the other valve, and some lamellae are also divided. Between them a lot of low ribs, and between these rib salmon-coloured furrows occur.

The interior sides are white, with some purplish in the hinge part or along the margins. The pallial line connects the middle of the adductor scars. The margins are smooth.

Habitat. — D. Peled collected his specimen (IX-1977) in 2-3 meters, attached on rocks.

## Type material.

Holotype, to be deposited in KBIN: Attached (left) valve 57 x 34 x 26 mm; upper (right) valve 48 x 36 mm. Collected by D. Peled (1977) in Eilat North, Gulf of Aqaba. Figured on plate VIII, fig. 1 and 4.

Paratype 1, in coll. author: Attached (left) valve 52 x 47 x 21 mm; the free (right) valve 46 x 41 mm. Collected off Eilat (1977), Gulf of Aqaba. Don. E. Haviland. Coll. author: "Ch. 25"

Figured on plate VIII, fig. 2 and 4.

Paratype 2, in coll. Haviland: Attached (left) valve 58 x 35 x 26 mm; upper (right) valve 47 x 39 mm. Collected off Sharm el Sheick, Gulf of Aqaba. Figured on plate VIII, fig. 3.

Paratype 3 and 4, in coll. Rapoport (18, Hashnayim St., Givatayim, Israel). Collected by H. Rapoport, from depth of about 1,5 meters in Eilat. These two paratypes are figured in this article.

Type locality. — Eilat, Gulf of Aqaba.

## Discussion.

Lamarck's description (1819: 96) for his *Chama croceata* or "Came safranée" is as follows: "Ch. testa suborbiculari, crocea; squamulis albidis prominulis subaspera; valva minore convexa. Habite... les mers des climats chauds". The species is represented by DELESSERT (1841: pl. 13, fig. 6 a-b) and by CHENU (1846: pl. VII, fig. 3-4), but this last author figured one specimen of the genus *Chama* and another of the genus *Pseudochama*. The two types are in MHNG; they are exactly as figured by CHENU. The *Pseudochama*, reg. n° 1087/4, measures 36 x 30 mm and is hereby selected lectotype of *Pseudochama croceata* (Lamarck). The other specimen, also reg. n° 1087/4, is a juvenile species, labeled "var. dextrorse". However, *Pseudochama croceata* (Lamarck) is not at all similar to the new species.

Cuming received a specimen under the name *C. croceata* Lamarck, but Reeve (1847: pl. VIII, fig. 46) thought it to be a different and new species, because it did not match Lamarck's description; he named it *C. praetexta*. The most important part of Reeve's description is: "...both valves very beautifully concentrically fimbriated..." The holotype is in BMNH and measures 37 x 29 mm; very accurately figured by REEVE (1847: fig. 46). No type locality is given. *Chama praetexta* is also figured by CLESSIN (1889: pl. 15, fig. 3), who gives the locality Mauritius. Lamy (1921: 237-238; 1927: 313-314) identified with this figure a specimen of *Chama* collected by Jousseume off Djibouti, and labeled by him "*C. sinuosa* Broderip" (a Brazilian species!). But, it is impossible to recognize the holotype of *C. praetexta* Reeve in CLESSIN's figure, nor in Jousseume's specimen kept in MNHN (attached valve measures 36 x 29 mm). As not confirm to *C. praetexta* Reeve the Jousseume specimen must be considered an unnamed species. It is probably also different from our new species, because of the clockwise rows of foliation, and other, minor details.

*Chama frondosa* Broderip, 1834 is a species, sometimes also saffron coloured and with lamellae "finely radiately plaited sinuous, in two rows radiating from the umbones" (REEVE, 1846: spec. 1).

But this species is easy to distinguish as it is from Pacific America and because of its finely radiately grooved and much stronger lamellae. A distinguishing mark are also the minutely crenulated margins of *C. frondosa*.

The only species known from the Red Sea resembling the new species is *Chama imbricata* Broderip (= *C. plinthota* Cox) but this species which is very constant in its appearance, is easily distinguished by its typical kind of foliation. *C. plinthota* is also figured on plate VIII, fig. 5-6.

Name. — The new species is named *Chama yaroni*, dedicated to the late Dr. Isaac Yaron (1934-1985) from the Ben-Gurion University of the Negev, Beer-Sheva, Israel.

Acknowledgement. — The author is very grateful to Mr. D. Peled (Israel) and to Mr. E. Haviland (Florida) for the donation of the typical-material.

Acknowledgement. — Thanks are due to the staff of the Mollusca Sections in BMNH, KBIN, MHNG, MNHN and RNH, for permission to study and photograph material in their collections.

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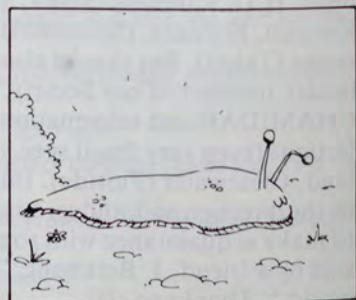
### THANKS TO...

First of all we have to mention here dr. J. Van Goethem, KBIN. His department of Rec. Invertebrates was the home-base where no trouble was too much. Here we could study again and again the rich collection of Dautzenberg and nearly each original publication. We thank also A. Lievrouw for his patientfull help, often in very busy times. — We thank S. Morris and K. Way from the Mollusca dep., BMNH; dr. B. Métivier, Lab. Biol. des Invertébrés Marins et Malac., MNHN; prof. dr. E. Gittenberger, Mollusca dep., RNH; dr. H. Coomans and R. Moolenbeek, his Assistant Curator, ZMA; the Librarian of the Royal Zoological garden, Antwerp. We met alle these people personally and remember their hospitality. Thanks for help during our correspondency (often with borrowed material): Dr. Janssen, SMF; A.W. Janssen, Rijksmus. Geologie & Mineral., Leiden (The Netherlands); dr. Al. Barash, dep. zoology, TAU; J. Rapoport, Givatayim (Israel). But especially we thank mr. H.K. Mienis, Curator of the Mollusc Collection, HUZ (Israel). Material was sent by dr. H.D. Rabesandratana, Station Marine de l'Univ., Tuléar (Madagascar); A. Kengalu, Honiara, (Solomons); M. Montilla, Quezon City (Philippines); M. Marescot (Tahiti). But thanks also to F. v. Nieulande, Nw. & St. Joosl. (The Netherlands), member of our Society, for the donation of a collection of fossil species of CHAMIDAE and information about. For sending the material of their own collections (even very fragil spec.) we thank Dov Peled, Tivon (Israel) and Ed. Haviland, Clearwater (Florida). Important help was the interesse and encouragement by the direction and studygroup of our Society. By this study we had the opportunity to make acquaintance with some most sympathetic persons and we repeat what is said by a friend, J. Berkhout: "Shells are the medium to meet gentle people in this world." Thanks to all!

The author.

In this revision discussions are found under the following names:

<i>Chama asperata</i> (sic) Lamarck in Paetel, 1869 .....	p. 77
<i>Chama asperella</i> Lamarck, 1819 .....	p. 77
<i>Chama aspersa</i> Reeve, 1846 .....	p. 79
<i>Chama brassica</i> Reeve, 1846 .....	p. 81
<i>Chama brassica elatensis</i> nov. subsp. ....	p. 82
<i>Chama broderipi</i> Reeve, 1846 = <b>Chama pacifica</b> Brod. ....	p. 83/102
<i>Pseudochama corbieri</i> (Jonas, 1846) .....	p. 84
<i>Pseudochama corrugata</i> (Brod.) not in the Red Sea .....	p. 86
<i>Chama fibula</i> Reeve, 1846 .....	p. 87
<i>Pseudochama fimbriata</i> (Reeve, 1847) = jr. and prim. homonym ...	p. 87
<i>Chama foliacea</i> Quoy & Gaimard, 1835 = (probably) <b>C. pacifica</b> ...	p. 88
<i>Chama fragum</i> Reeve, 1846 .....	p. 88
<i>Chama gryphoides</i> (Linné) Lamarck, 1819 .....	p. 90
<i>Chama lazarus</i> Linné, 1758 .....	p. 91
<i>Chama limbula</i> Lamarck, 1819 .....	p. 94
<i>Chama pacifica</i> Broderip, 1834 .....	p. 102
<i>Chama douvillei</i> "Jousseume" Lamy, 1921 .....	p. 112
<i>Chama plinthota</i> Cox, 1927 .....	p. 114
<i>Pseudochama radians</i> (Lamarck, 1819) not in the Red Sea .....	p. 116
<i>Pseudochama ruderalis</i> (Lamarck, 1819) not in the Red Sea .....	p. 118
<i>Pseudochama ruderalis riaenae</i> nov. subsp. ....	p. 118
<i>Chama yaroni</i> nov. species .....	p. 120
References .....	p. 122



**ERRATA** in the paper of the Recent Cancellariidae of Indonesia, GM: 25 (2).  
 Apart from a few minor printing errors, the following major errors should be corrected:  
 p. 31 Museum List:  
 NMR (not MNB) Natuurhistorisch Museum Rotterdam, The Netherlands  
 (add) ZMA Zoologisch Museum, Amsterdam, The Netherlands  
 p. 34 First reference to *Bonellitia garrardi*:  
 Change (*nom. nov.* ...) into (non...).

## PROGRAMMA

### Zondag 4 mei

Naar gewoonte wordt het een beurs-middag waarop geschelpt kan worden naar hartelust.  
 Geen voordracht, wel een onderonsje met dhr. Menkhorst (microshells).  
 Hopelijk met veel levendige contacten.

### Zondag 25 mei

Mits voldoende belangstelling, voorzien we een dagtrip naar St. Omer. Iedereen is welkom,  
 ook familieleden en vrienden. Vertrek met de autobus aan Stella Maris (Antwerpen). Uur  
 en prijs zal nog worden meegedeeld. Inlichtingen kunnen ingewonnen worden bij de onder-  
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### Zondag 1 juni

Voordracht door M. Wagenaar: De fossielen van Whitby.

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Gloria Maris	25 (3)	128 - 131	Antwerpen, mei 1986
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## DE EUROPESE POLYPLACOPHORA (AANVULLINGEN II)

R.A. VAN BELLE\*

### 1. De Europese *Acanthochitona* soorten (Plaat 37)

In een langverwachte, uitvoerige en prachtig geïllustreerde publicatie heeft de Heer P. Kaas (Leiden) eindelijk klaarheid gebracht in het ingewikkelde probleem van de Europese en West Afrikaanse *Acanthochitona* soorten. Voor wat de eerste groep betreft, nog steeds 3 soorten, dienen volgende veranderingen aangebracht in de bestaande werken:

blz. 2 — *A. fascicularis* (Linnaeus, 1767) moet voortaan *A. crinita* (Pennant, 1777) heten. Voor "Originele diagnose" zie blz. 3. De rubriek "Synoniemen" wordt: *Chiton onyx* Spengler, 1797; *Acanthoactes vulgaris* Leach, 1852; *Acanthochites adan-soni* de Rochebrune, 1881; *Acanthochites bouvieri* de Rochebrune, 1881; *Acanthochiton oblongus* Leloup, 1981. De "Verspreiding" moet aangevuld worden, lijn 8, met: "en tot bij de Kaap Verdische Eilanden", de rest vervalt. Op te merken dat *Acanthochites carinatus* Risso, 1826, en *Chiton globulosus* Brusina, 1870, voortaan als *nomina dubia* beschouwd worden.

blz. 71 — *A. communis* (Risso, 1826) moet voortaan *A. fascicularis* (Linnaeus, 1767) heten. Voor "Originele diagnose" zie blz. 2. De rubriek "Synoniemen" wordt: *Acanthochites communis* Risso, 1826; *Acanthochites carinatus* H. Adams & Angas, 1864; *Acanthochites hamatus* de Rochebrune, 1882; ? *Acanthochiton heterochaetus* Bergenhayn, 1931; *Acanthochiton bonairensis* Kaas, 1972. De rubriek "Variëteiten" moet, vooraan, aangevuld worden met: *Chiton fascicularis* L. var. *major* Philippi, 1836, Enum. Moll. Sic., 1: 108. Op te merken dat *Chiton echinotus* de Blainville, 1825, en *Acanthochites aeneus* Risso, voortaan als *nomina dubia* beschouwd worden.

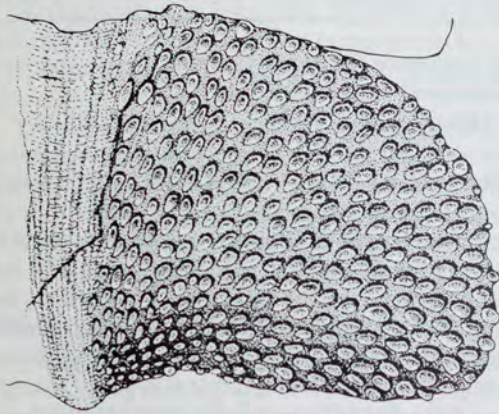
blz. 123. — *A. gracilis* (Jeffreys, 1859) moet voortaan *A. discrepans* (Brown, 1827) heten. De "Originele diagnose" moet vervangen worden door: Brown, T., 1827, Illustrations of the Conchology of Great Britain and Ireland, pl. 35, fig. 20. "Chiton, Ency, Method. pl. 163, fig. 11, 12. Several specimens of this new shell, as a British species, were sent to me by George Lyons, Esq. of Tenby, Wales, as the *C. fascicularis*, which shell, it would appear, is not known on that coast" (Chiton). De rubriek "Synoniem" bevat alleen nog: *Chiton gracilis* Jeffreys, 1859. Op te merken dat *Acanthochiton heterochaetus* Bergenhayn, 1931 als waarschijnlijk synoniem van *A. fascicularis* beschouwd wordt, en dat *Acanthochiton subrubicundus* Leloup, 1941 een volwaardige, West Afrikaanse soort blijkt te zijn.

### REFERENTIE

Kaas, P., 1985 The genus *Acanthochitona* Gray, 1821 (Mollusca, Polyplacophora) in the north-eastern Atlantic Ocean and in the Mediterranean Sea, with designation of neotypes of *A. fascicularis* (L., 1767) and of *A. crinita* (Pennant, 1777), Bull. Mus. natn. Hist. nat., Paris, 4(7) A(3): 579-609, fig. 1-92.

\* Nijverheidsstraat, 22 - 2700 St. Niklaas.

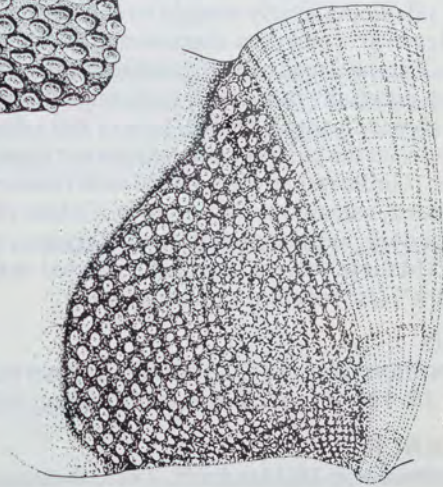
## PLAAT 37



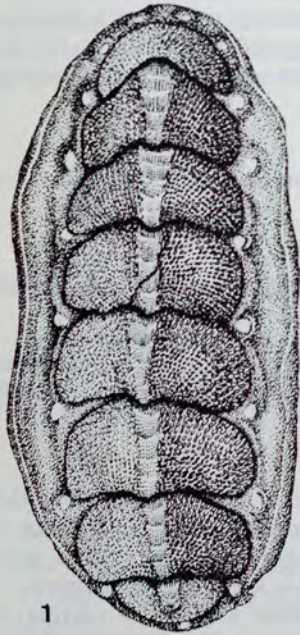
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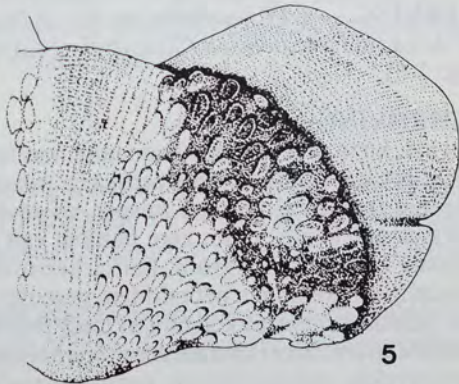
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1



5

UITLEG BIJ DE FIGUREN VAN PLAAT 37

1. *A. discrepans*, bovenzicht, exemplaar van Tenby, Wales, x 3,6 (Kaas, 1985).
2. *A. discrepans*, zelfde exemplaar, detail van schelpstuk IV, in situ, x 15 (idem)
3. *A. fascicularis*, bovenzicht van schelpstuk I, exemplaar van Oran, Algerie, x 8,4 (idem)
4. *A. fascicularis*, zelfde exemplaar, detail van schelpstuk II, x 17,5 (idem)
5. *A. crinita*, bovenzicht, detail van schelpstuk IV, exemplaar van Portivy, Bretagne, x 17,5 (idem)

2. Volgende nieuwe soort kwam de Europese fauna vervoegen:  
***Ischnochiton (Stenosemus) vanbellei* Kaas, 1985**  
 (Plaat 38)

**ORIGINELE DIAGNOSE**

Kaas, P., 1985, Notes on Loricata (Mollusca) 11-14, Zool. Meded. Leiden 59(25): 316, fig. 55-68, kaart 2.

"Animal oval, small (estimated maximum length c. 10 mm), moderately to rather highly elevated (dorsal elevation varying from c. 0.3 tot 0.5: holotype 0.37), carinated, side slopes nearly straight to slightly convex, the valves not or only little beaked. Head valve and post-mucronal area of tail valve with c. 16 nodulose radiating riblets. Lateral areas of intermediate valves raised, with two (by splitting sometimes 3-4, especially in valve II) radiating nodulose riblets. Central areas of intermediate valves and antemucronal area of tail valve with a variable number of longitudinal sulci on the pleurae, much narrower than the smooth, rounded ribs separated by them. Girdle rather wide, paved with relatively large, short, bent, round-topped, juxtaposed, calcareous corpuscules. Colour of tegmentum either brick red (holotype), or dark purple (paratype from Capraia), or variegated with yellowish and dark brown (Maltese valves), the girdle banded in the same colours, alternatively light and dark" (*Ischnochiton (Stenosemus)*).

**GENUS**

*Ischnochiton* Gray, 1847, Additional Observations on Chitones, Proc. zool. Soc. Lond. 15: 126. Type: *Chiton textilis* Gray, 1828.

**SUBGENUS**

*Stenosemus* von Middendorff, 1847, Beiträge zu einer Malacozoologia Rossica, Mém. sc. nat. Acad. Imp. Sc. 6: 34. Type: *Chiton albus* Linnaeus, 1767.

**OPMERKING.** — *I. (S.) vanbellei* werd in de literatuur reeds vermeld en geïllustreerd onder de naam *Ischnochiton (Simplischnochiton)* cfr. *dorsuosus* (Van Belle, 1977: 28, fig. 3-6).

**BESCHRIJVING**

Dier ovaal, klein, maximum 10 mm lang, matig tot sterk verheven, gekield, zijkan- ten recht tot licht convex, schelpstukken weinig of niet gebekt (fig. 1). Kleur van tegmentum steenrood, donker purper, of gevlekt in geel en donker bruin, gordel in afwisselende lichte en donkere banden van dezelfde kleur als tegmentum. Schelpstuk I betrekkelijk groot, halfcirkelvormig, achterrandsrand V-vormig, met een duidelijke inkeping in het midden, gesculpteerd met ca. 16 gekorrelde, radiaire ribben. Middenschepstukken min of meer rechthoekig, voorrand licht convex, achterrandsrand praktisch recht, laterale area's verheven, voorzien van 2, door splitsing soms 3-4, gekorrelde, radiaire ribben, centrale area's met aan elke zijde 7-9 fijne, longi- tudinale groeven, gescheiden door brede, ronde ribben, de binnenste groeven

bereiken de voorrand niet, zij worden korter naar de brede, gladde jugale area toe (fig. 4). Schelpstuk VIII ongeveer 2 x zo breed als lang, min dan cirkelvormig, mucro vóór het midden, weinig verheven, postmucronale area gesculpteerd met ca. 16 gekorrelde, radiaire ribben, antemucronale area gelijk centrale area's (fig. 5-6).

Articulamentum witachtig, tegmentale kleur dóórschijnend, apophyses klein, afgerond, gescheiden door een ongeveer rechte, zeer fijn getande, jugale sinus; insertieplaten kort, insertieformule 9/1/9, tanden eerder stomp, ruw aan de buitenzijde.

Gordel eerder breed, bezet met korte, gebogen, omgekeerd kegelvormige kalklichaampjes (fig. 10), min of meer verspreid in quincunx (fig. 9). Er is een zoom van lancetvormige, distaal gegroefde stekels (fig. 11). De onderzijde van de gordel is bedekt met radiaire rijen van rechthoekige schalen (fig. 8).

De hoektand van de radula draagt een snede betaande uit een lange, scherpe tand, aan de buitenzijde voorzien van een tweede veel kleiner tandje (fig. 7).

## VERSPREIDING

*I. (S.) vanbellei* is een mediterrane diep water soort, bij voorkeur verblijvende op witte koraalbanken op 400-500 m diepte. Er werden totnogtoe 2 levend exemplaren gevonden, respectievelijk bij de eilandjes Gorgona en Capraia in de Ligurische Zee, plus een aantal losse schelpstukken bij het eiland Malta.

## REFERENTIE

Van Belle, R.A., Nota's over minder gekende keverslakken van de Middellandse Zee (Mollusca: Polyplacophora), *Gloria Maris* 16(2): 27-35, 1 plaat.

Onze verontschuldiging aan de auteur: We hebben dit waardevol artikel moeten splitsen wegens plaatsgebrek. Plaat 38 en de bijhorende uitleg zal worden gepubliceerd in een volgend nummer.

Aan de lezer:

Bent u geïnteresseerd in het prachtig werk dat geleverd werd door de auteur R. VAN BELLE: *DE EUROPESE POLYPLACOPHORA* (volledig, 151 pp. + aanvulling I), uitgegeven in de voorbije jaargangen van *Gloria Maris*?

Dit werk kan nog steeds verkregen worden (zolang de voorraad strekt) tijdens onze algemene vergaderingen of langs de sekretaris: J. Wuyts (adres en telefoon: zie kaft).

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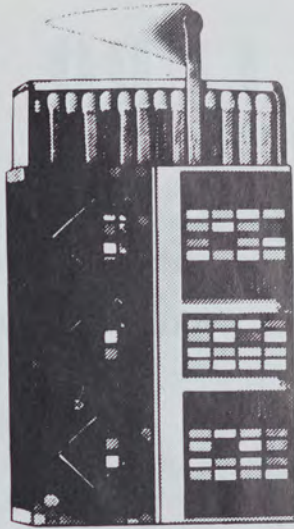


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